

Self-guided Nature Trail

As you begin your tour along the boardwalk, try to be as quiet as possible and look and listen for what is living around you.

1

The first 50 feet of the boardwalk is surrounded on both sides by brush and trees. The largest trees are eastern cottonwood (*Populus deltoides*). Their leaves seem to be in constant motion. This is caused by the leaf stem or petiole being flattened so that the slightest breeze causes it to sway. Many of these are dying from two causes: girdling the trunk by beavers or drowning of the roots due to higher water levels than when they started growing 40 years ago. Other species include bittersweet vine, boxelder, soft or silver maple, American elm and red elm. Most of these species have been labeled with aluminum tags. The most common species of small tree is rough-leaved dogwood (*Cornus drummondii*). This tree was used for a variety of things by American Indians, including arrow shafts, because they have straight and sturdy stems.

2

Where the grassy marsh and trees meet is what ecologists call an ecotone. This refers to the edge between two habitat types. In this case it is fairly abrupt, but the edge may change over time if trees grow up in the marshy area. Five different methods have been used to control woody vegetation within the wetlands: 1) fire, 2) flooding, 3) mowing, 4) cutting by hand and 5) treating chemically. Each of these has positives and negatives effects. Some of the wetlands will be allowed to remain brushy or wooded; the majority, however, will continue to be managed for open, grassy or marshy areas. This is what was present historically and will continue to be the predominant vegetation type.

3

Stop to examine the organisms in the water under the boardwalk. In the spring and early summer there is usually water underneath the boardwalk. The source of this water is from rain that falls within the levees of the Baker Wetlands. There is also a pipe in the levee near the kiosk that could allow water in from the canal by opening the "screw valve" located on the south side of the levee. Usually the water in the canal is not high enough to allow much water in.

To get a better view of the aquatic organisms that live under the boardwalk you can lay down and look over the sides. You may see small mosquito fish as they quickly swim away or hide in the vegetation. They can see your movement and are often frightened. These small fish reproduce quickly in spring and summer and are very effective at controlling mosquito populations.

Other organisms that are usually very common are pond snails and ram's horn snails, red water mites, frog tadpoles and salamander larvae, a variety of insects, both juvenile and adult stages,

and a host of other invertebrates. A rather unusual invertebrate that is occasionally seen is the fairy shrimp. It looks something like a miniature elongated crayfish that swims upside down and has a large number of swimmerettes on the abdomen.

4

This is an open stretch typical of seasonal wetland vegetation. In early spring and summer it is dominated by dark-green round leaves called spikerush (*Eleocharis sp.*); the thin, yellow-green grass-like blades are several species of sedges (*Carex sp.*). The sedges can be identified by their triangular stems. There's an old saying "Rushes are round but Sedges have edges." Later in the summer you find a wide-leaved grass that is rice-cutgrass. If you touch them gently you can feel the saw-blade edges and down the center "rib" of the grass. Be careful as these blades can leave nasty cuts on bare skin.

lodge. Cattails provide cover but little else to most wildlife. In the spring and fall you may find ducks or herons in the cattails and in summer you may find red-winged blackbirds.

6

From this location you may be able to watch numerous aquatic organisms swimming about. Sit quietly and allow some of the reclusive species to come back out from the shadows. In early spring you may discover calling frogs and it is an excellent place to look for fairy shrimp. Later in the summer the pool may be alive with small fish like the mosquito fish and tadpoles.

8

Notice the row of medium sized trees to the south. These are mostly green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americanus*). They are growing on an artificial ridge of soil that was placed there in the 1920's as a means of draining the area for grazing. You will also notice a low swale that goes under the boardwalk both left and right. These swales were dredged in order to create the ridge. With current water levels being higher than in the past the ridge is elevated just enough to allow the trees to keep their roots above water. Most of these trees have only been here since the early 1990's.

Notice the much larger clump of large trees about 250 yards to the southwest. This indicates a much larger natural swale that has contained trees for over 70 years.

9

Look for sparrows, wrens and small warblers along this long stretch. There is another small, shallow pond to the west, but it is heavily ringed with cattails. Notice the strip of reed canary grass (*Phalaris arundinacea*) on your right to the north. It is growing on a slight rise. It is a plant that is often introduced into wetlands to provide food for waterfowl. It is not native to the Great Plains and has been considered to be an aggressive weed by many wildlife habitat managers. Baker is trying to control its spread with periodic early prescribed burns.

10

This is a test section of pressure-treated lumber to compare weathering and durability to the recycled plastic lumber from which the rest of the decking is made. Our studies show that the plastic should last longer, be more cost effective, and be a good alternative to throwing plastic into the landfill. The boardwalk was completed in March 1994.

11

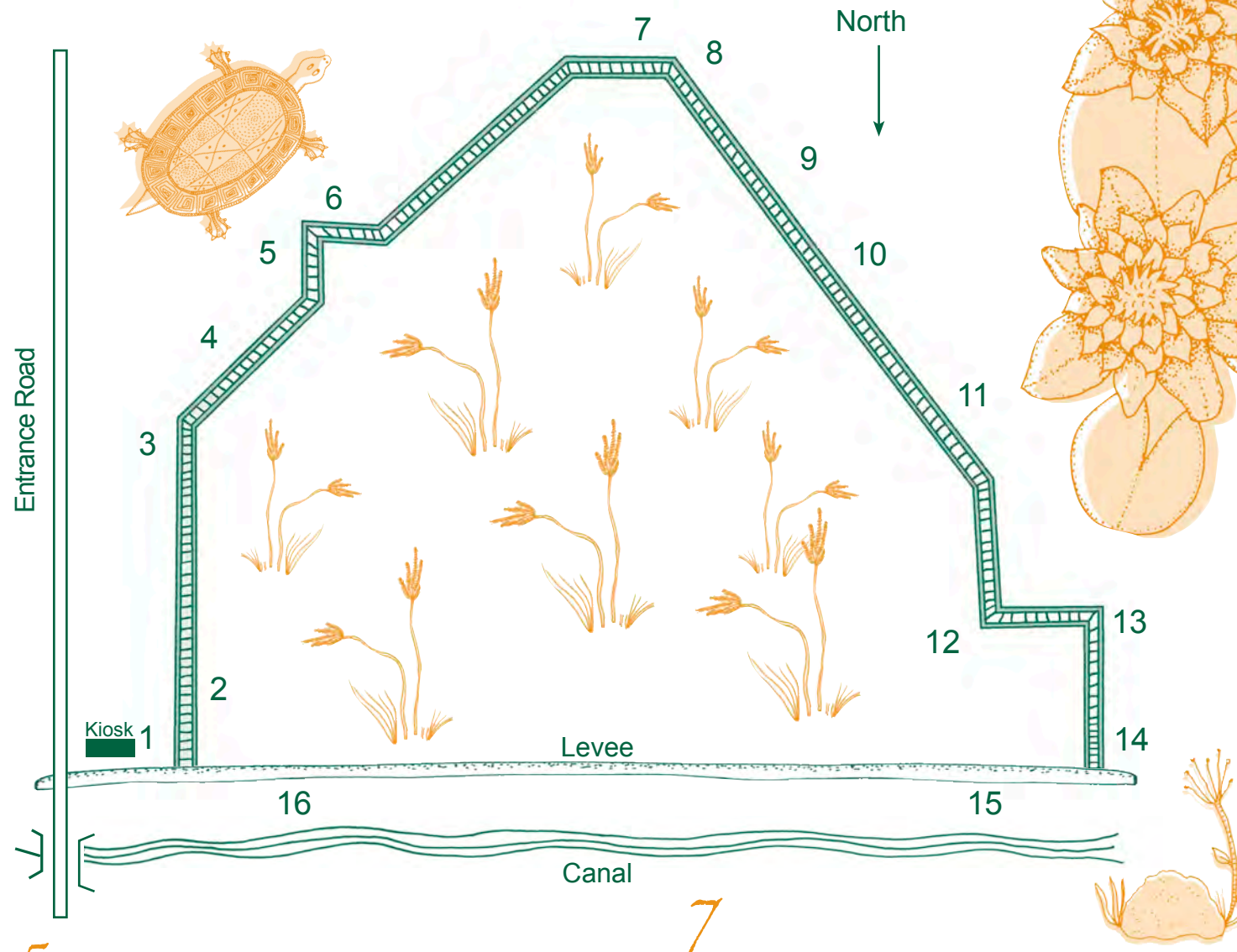
This is a slightly elevated area, once again showing a dense succession of American elm, red elm (*Ulmus rubra*), honeylocust (*Gledisia triacanthos*), and rough-leaved dogwood. They have become thick enough that burning does not affect them since there is little in the way of fuel on the ground to burn them in the spring. In a wet cycle these trees will probably die.

12

The thicket straight ahead is an excellent birding area during the spring and fall migration. During this time numerous birds frequent this area, e.g. warblers, vireos, flycatchers and thrushes.

13

This is a small depression that is slightly wetter and therefore not favorable for most trees. Instead what you find are sedges, spikerushes, arrowhead (*Sagittaria latifolia*), and water plantain (*Alisma triviale*). The latter plant has round or oval leaves with large, open seed head with tiny seeds and flowers. This area will continue to change as water levels fluctuate and may continue to be invaded by reed canary grass. This is a good spot to sit in the spring or fall sun and let your troubles of a busy life fade away for a short time.



5

Stop and sit near the clump of black willow (*Salix nigra*). Listen for the sounds of the seasons. You may also be able to see various birds throughout the year. During the warmer seasons a variety of amphibians and insects should also be active both in and below the tree.

To the southeast is a recent depression that was created. This area was nearly choked with cattails within several years, however muskrats have opened it back up in the process of building their

7

This is a low swale which was dredged in order to create a slight ridge (see #8). This technique was known as "W" ditching or bedding. It is a common agricultural practice in flood plains and was used extensively on the Old Haskell Farm. You may notice a variety of rushes, sedges and wildflowers like bidens and smartweed which only grow in these lower swales. This swale used to drain through culverts in the north levee and then down the canal to the east. Baker was able to plug these culverts in 1991, thus reverting this area to wet meadow habitat. This particular swale is rarely wet long enough to support fish. It is usually abundant with amphibians and aquatic invertebrates in the early spring.



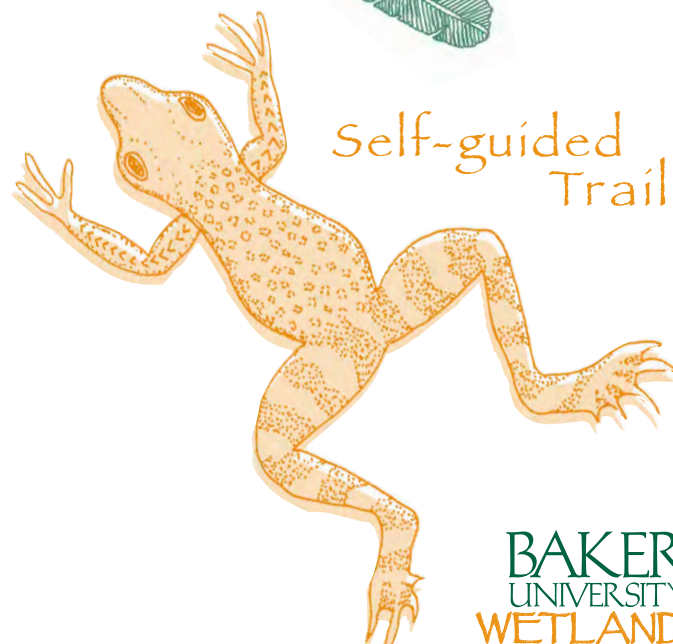
The Baker Wetlands Research and Natural Area covers 573 acres in the Wakarusa River floodplain including 45 acres of native wetland prairie. The area was acquired by Baker University from the federal government in 1968 and is used for education and research on a variety of ecological phenomena and preservation. The area was identified as a National Natural Landmark by the National Park Service in 1969 and a Natural and Scientific Area by the state of Kansas in 1987.

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Illustrations courtesy of Joanne Tolkoff



BOARDWALK to Nature



14

This is another good location to sit quietly and look around you. Mosquito fish are common in the water channel underneath the boardwalk. Trumpetvine (*Campis radicans*) in the large cottonwoods to the left are visited by ruby-throated hummingbirds in summer. The wood duck nest box ahead of you may be occupied between March and May. Only luck or quiet patience will afford you a glimpse of the female coming or going during incubation.



15

As you return to the Kiosk to the right you should keep your eyes open for several things.

In the canal are many small floating plants that have 2-3 leaves. These are called duck weed. There are several species, depending on size, including a tiny one called watermeal that is the size of a grain of sand. These are true flowering plants, the smallest in the world. Duckweed commonly had another organism, called Nostoc algae (actually it is a Cyanobacteria rather than an algae) which lives inside their leaves. Nostoc is very effective at removing nitrates and ammonia from the water. This makes duckweed a useful plant for waste water treatment plants.

Watch for turtles that like to sunbath on the logs along the canal. All of these are painted turtles (*Chrysemys picta*). We also have numerous common snapping turtles (*Chelydra serpentina*) but they don't sunbath.

About 75 feet down the trail you may notice a concrete water tank to the right and a remnant of a windmill across the canal to the left. Both of these are reminders that this area used to be part of the grazing operation of the Old Haskell Farm in the early 1900's.

You should also notice a large amount of rubble of cut stone, concrete, and large pieces of tin that are the remains of a building(s) that was on the Haskell campus. Even though this rubble is unsightly and out of place it actually provides excellent habitat for numerous animals like amphibians, reptiles and small mammals. Some of this material has been used in constructing the boardwalk, kiosk, observation blind and several other projects around the area.

In several places along the levee you may notice trees that have been chewed by beavers. Often they girdle the tree and then don't cut it down until several weeks later. This will actually increase the sugar in the vascular cambium just inside the bark. This is a good thing for beavers as they don't eat wood - they only eat the living tissue called cambium, just underneath the bark and outside the wood.

16

At this location you will see many sticks that have had their bark chewed off. This is a beaver lodge. In this lodge, which may actually extend under where you are standing, lives a pair of beavers. In the spring the female gives birth to kits. These kits may stay for over a year and actually help raise the next brood. This pair has built a dam under the bridge.

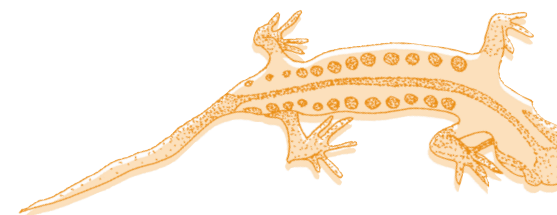


Wetlands History

The Wakarusa and Kansas River floodplains have developed since the last Ice Age some 10,000 years ago. This area was historically used by American Indians of the Kanza tribe. In the early 1850's the Oregon Trail crossed the Wakarusa approximately 1/4 mile east of current Louisiana Street Bridge. In 1857 the region was platted and acquired by homesteaders. These plots changed hands several times before being purchased by the Bureau of Indian Affairs between 1890 and 1902.

Most of the land was cultivated by the time BIA purchased it. In 1920 BIA completed a large drainage project consisting of a number of levees, large drainage ditches along the north and east half, surface bedding, and drainage tile to the river. These projects were very effective in lowering the water table in all but the wettest years. About 80% of the property had been tilled to some extent and 100% had been drained. The area was used by Haskell Boarding School for education and producing food until 1934. At this time BIA terminated agricultural training and the land was leased to local farmers.

BIA declared the acreage surplus in 1956 and transferred it to the General Services Administration. In 1967 it was transferred to the Dept of Health, Education and Welfare. Baker University requested the property for the purpose of education, research, and restoration to native habitat.



Beginning in 1968 Dr. Ivan L. Boyd directed its use and development and was instrumental in having the area declared as a National Natural Landmark due to two original tracts of wet meadow. After an accident while conducting a burn claimed Dr. Ivan Boyd's life in 1982, his son Dr. Roger Boyd became manager of the facility. During the 70's and 80's the crops fields were planted to native grasses and forbs. In the early 90's a series of grants from U.S. Fish and Wildlife Service, Western Resources and a number of local organizations enabled a reversal of earlier drainage projects. The area became wetter and wetland vegetation and wildlife returned.

Since then the Boardwalk to Nature, information kiosk, an observation blind, and numerous bird nesting structures have been built. There are approximately 5.5 miles of walking trails around the levees and roads. The area is open to the public from dawn to dusk. The proposed 32nd Street alignment of the South Lawrence Trafficway would destroy 70 acres but mitigation would expand the wetlands by 300 acres, replace the current Boardwalk, build a visitor's center, and establish an endowment fund for maintenance. The University believes this is an adequate compromise that will allow completion of the SLT without jeopardizing the University's long-range goals of education and preservation of the wetlands core.

Wetlands Management

Baker Wetlands has a variety of habitats - wet meadows, upland prairie vegetation, shrubby habitat, open water marshes, and dense woodlands. The largest portion of the Wetlands is managed for wet meadows and native grasses. Annual prescribe burns reduce the litter build-up and release nutrients back to the soil, as well as control woody vegetation. Usually these burns take place in the spring but future burns may also occur in late fall or winter to stimulate different plants.

We also manage the bodies of water. We have created a few pools to increase diversity but must allow some areas to dry up each year to reduce or eliminate fish which are predators to breeding amphibians and insects. We do, however, encourage the presence to mosquito fish which reproduce rapidly in shallow water and are effective at reducing mosquito larvae.

We hope you have enjoyed your experiences on the Boardwalk to Nature. If you have comments about the Boardwalk or the Wetlands or if you are interested in supporting our mission of environmental education send your comments and tax deductible donation to:

Baker University Wetlands
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Baldwin City, KS 66006

