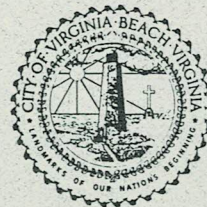


**ELIZABETH RIVER
NATURE AND CANOE TRAIL**

**Carolanne Farm
Neighborhood Park**

VIRGINIA BEACH, VIRGINIA



established in 1995

TO ENJOY THE TRAIL - OF
ENJOYABLE

It is a pleasure to the Elizabeth River Nature and Canoe Trail. The trail is a beautiful and scenic area that provides a unique experience for the visitor. The trail is a beautiful and scenic area that provides a unique experience for the visitor. The trail is a beautiful and scenic area that provides a unique experience for the visitor.

**ELIZABETH RIVER
NATURE AND CANOE TRAIL**

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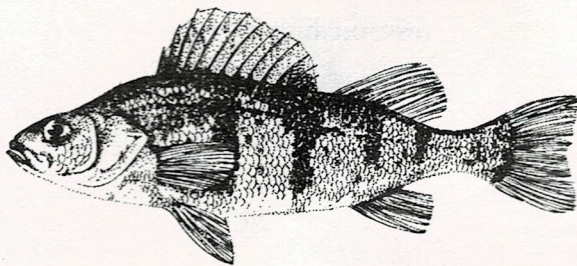
VIRGINIA BEACH, VIRGINIA



established in 1995

NATURE AND CANOE TRAIL

Welcome to the Elizabeth River Nature and Canoe Trail, part of Carolanne Farm Neighborhood Park. The park offers two trails, one on land, the other on the water. Trail markers have been placed to help you gain a deeper appreciation of the special quality of this unique area. Follow the maps in this brochure and markers for a self - guided tour on land, water, or both. Most of all, pause to use your senses on your visit - sights, sounds, smells, and touch - all will give you an opportunity to learn more about this place. Feel free to pause, reflect, sit and contemplate on your visit. Please remember to leave only footprints, taking only photographs or memories with you, so that others may also enjoy their visit. Please don't cut or deface plants or trees. Help keep your park a special place by kindly placing litter you generate or discover on your visit in one of the available trash receptacles. Most of all, ENJOY YOUR VISIT and come again soon, for each visit will offer a different sensory experience in this changing place.



TO MAKE YOUR VISIT MORE ENJOYABLE

Please consider bringing these items with you when you walk or canoe the trails, depending on seasonal conditions.

- ___ trail brochure
- ___ binoculars
- ___ sunglasses
- ___ insect repellent
- ___ sunscreen or sunblock
- ___ tide table or chart
- ___ walking shoes
- ___ camera
- ___ sun hat
- ___ watch
- ___ life jacket
- ___ snack
- ___ drinking water
- ___ field guides of plants and animals

Remember, the park has no restroom facilities. Also, be sure to check the tide conditions in the local newspaper before embarking on the canoe trail, as water levels can become quite shallow at low tide, posing problems for canoeing.

FOR FURTHER INFORMATION

Please visit the Virginia Beach Public Library to learn more about precolonial culture, colonial settlement, local history, local ecology, and regional plants, animals, and natural communities.

A BRIEF HISTORY OF THE AREA

The Chesapeake Indians lived in this area four hundred years ago. They grew crops, hunted and fished on the lands and waters of what is now part of the City of Virginia Beach. Some of their fishing was done at night, with fires in the canoes to attract fish. These Indians paddled up what is now known as the Eastern Branch of the Elizabeth River to fish in the same waters that now flow by this park. They would often put ashore to make camp in an area like this park due to its elevation above the adjoining marshes.

English and Spanish explorers likely explored this area as early as the 1580's, but English settlers arrived in the early 1600's. Soon, Kempsville, named for one of the earliest settlers in the area, George Kempe, had the largest population in what would become Princess Anne County, carved from Norfolk County. Kempsville has retained this distinction to the present day in the City of Virginia Beach, since the merger of the county with the town of Virginia Beach in 1963.

Once the only transportation artery for the local population, the Eastern Branch of the Elizabeth River served as a route for shallow draft vessels to the port of Kempe's Landing until the early 1900's. Boats would blow a whistle to let townsfolk know they were nearing the docks at Kempe's Landing, which was located near the former Kemps Landing Middle School. After docking, the boats had only a short time to load their cargoes of produce from local farms, or they would be grounded at low tide and forced to wait until the next high tide to float free. In earlier times, sailing ships would reach Kempe's Landing and leave for European and West Indies ports, but erosion induced by farming practices of the day gradually filled the channel to the port. This

filling intensified in the 1960's as urban development occurred in the watershed.

The area has changed a great deal since colonial times, and since the mid 1900's. It first passed through many hands as farmland. In the early part of this century, a large farm covered the area of the present park and much of the adjoining subdivision. The farm raised chickens, cows and pigs, along with grain crops of corn, wheat and soybeans. On Sundays, friends would come from miles around to visit. In the 1930's and 40's the farm became the site of a well known horse stable. The horses raised here were raced on a track next to the old Cavalier Hotel at the Oceanfront.

The park site was acquired by the City of Virginia Beach in 1982 when an old sewage treatment plant built in the early 1960's serving the subdivision was closed. It provides an excellent spot for getting away from the pace of the present city and rediscovering what this area must have been like in earlier and simpler times.

WETLANDS ECOLOGY

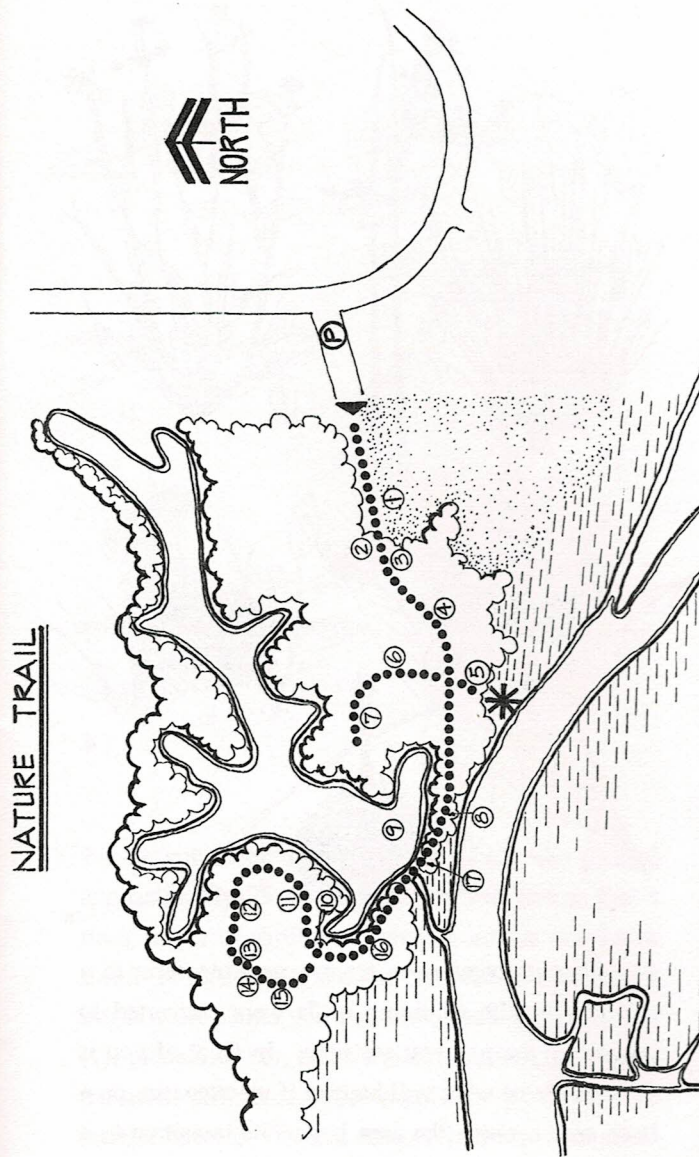
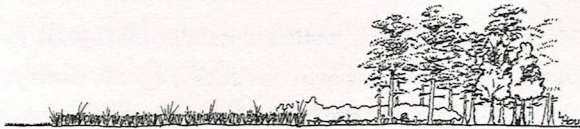
The park and adjacent river and marshlands have remained a natural island in the middle of a suburban landscape. It is an unusual place, containing both freshwater and saltwater marshlands, along with other plants and animals unique to the area. The *ecosystem*, or unique mix of plants, animals, water and soils in this area, have helped make this an unusual place. On a walk along the trail or a canoe trip down the river, a visitor may observe any number of animals which inhabit this ecosystem.

Many birds use this wetlands habitat during all or part of the year. This includes ducks, egrets, osprey, peregrine falcons, hawks, songbirds, and herons.

Wetlands provide food and shelter for many animals, including birds, small mammals, and marine life. This park is also home to a number of cold blooded animals. Watch where you step! This park contains frogs, turtles and snakes - including two poisonous kinds: the copperhead and the cottonmouth moccasin.

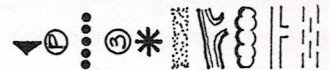
SPECIES SUCCESSION AND CHANGING ECOSYSTEMS

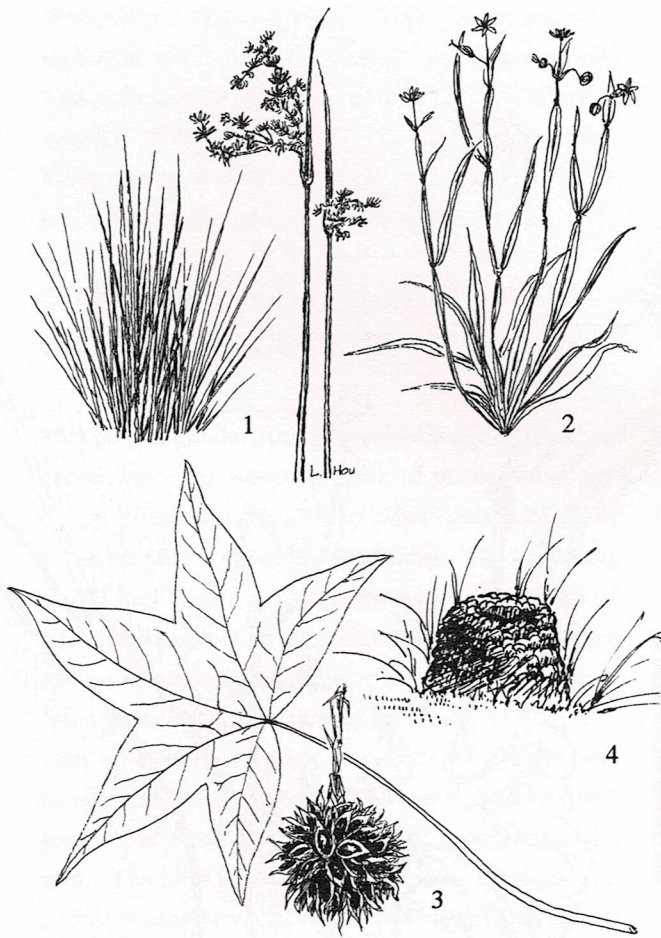
This natural habitat is an excellent example of *species succession* - the natural process of plants living and dying, then being replaced by other species of plants better adapted to changing conditions. The beginning of the trail shows a young *community*, or group of plants and animals living under similar conditions - a natural meadow which is being allowed to regenerate from the adjoining manicured lawn area of the park. This ecosystem supports a variety of grasses and meadow animals. If conditions are right, trees will grow from seeds that are blown or brought into the area. The pine forest in the park is an example of a middle community. It is a much more diverse habitat than that of the meadow. The pine forest provides support for vines and shade for shrubs. Its trees provide homes, food and protection for animals such as birds and squirrels. Slowly, as the pines die, succession continues and they will be replaced by oaks, maples, and hickories - a hardwood forest. The hardwood forest is inhabited by different animals and plants. When the forest remains in this state for many years, it will reach equilibrium and be called a *climax community*. In the event of a fire or other disturbance, the area will begin the cycle anew, becoming a climax community again, in the future.



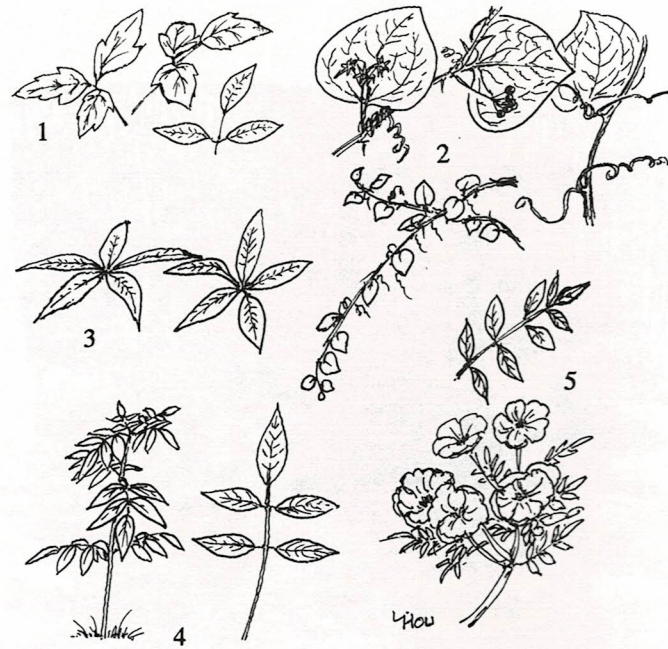
NATURE TRAIL

LEGEND
 PARK ENTRANCE
 STREET PARKING
 NATURE TRAIL
 TRAIL MARKER
 CANOE LAUNCH
 MEADOW
 RIVER / LAKE
 TREE LINE
 STREET ACCESS
 WETLANDS

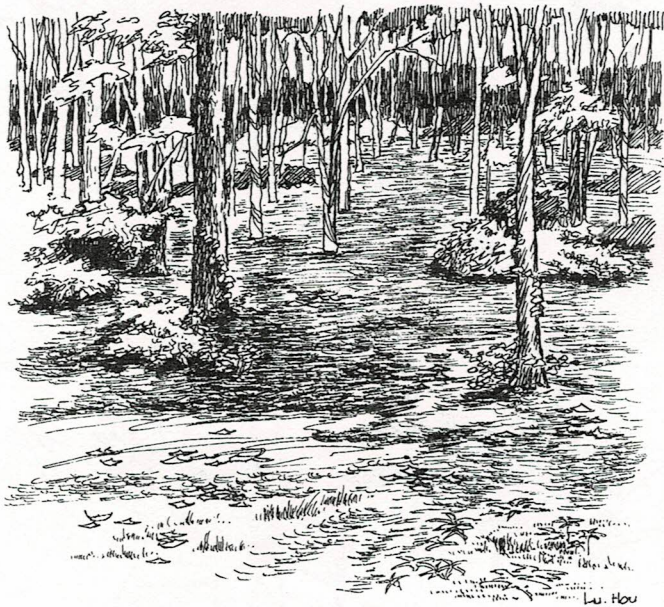




1- After its conversion from a working farm to a subdivision, the adjoining lands were converted to lawns like the one you see here. In front of you is an example of what will happen if maintenance on a lawn area ceases - the area begins its transition to a more natural landscape. This process in nature is called *plant succession*. After a disturbance, such as a fire, the grasses are the first plants to recolonize an area. Different kinds of grasses establish themselves and prevent erosion. The meadow will then begin to establish woody shrubs and hardy pioneer trees, such as loblolly pines. Notice the red maple to your right, needlerush (1) and blue-eyed grass (2) in the drainage swale, and sweet gum (3) overhead. If you look carefully, you may also see the mud casing marking the opening of a crayfish burrow (4).



2- As you enter the pine forest which was planted approximately 35 years ago, you will notice that a thick carpet of shrubs and vines occupies this forest floor. A pine forest is often crowded in its younger stages with plants you see here, such as poison ivy (1), greenbrier (2), and Virginia creeper (3). Notice the subtle difference between poison ivy and Virginia creeper leaves; Virginia creeper is not poisonous to humans. Behind you, growing along the sides of the swale, or ditch, you will see elderberry (4) and young shoots of bald cypress. Other plants you will observe along the edge of the woods in this area include wild rose (5), black cherry, and honeysuckle. In the spring and early summer the fragrances in this area combine and give a nice aroma. Listen for the many different songbirds which inhabit the edge of the meadow and the entrance to the woods. These edges are very important *habitat*, or home, for birds and other wildlife species.



3- Just beyond the swale you will notice an area which is void of the vines and shrubs you see elsewhere on the forest floor. This area is a good example of a *forested wetlands*. These areas serve important functions as filters for rainwater runoff, and help recharge shallow water aquifers, which many people use for watering lawns and gardens, and washing cars. Notice the water-stained leaves covering the ground in this area, along with the spreading, buttressed roots which help support the trees. These are good indicators of a forested wetlands. Underlying soils in an area like this are not as rich in nutrients as those in the surrounding forest, as frequent standing water leaches them from the soil. Behind you, notice the swale leads to an open marsh. This is one of the upper branches of Turtle Lake, which you will see later on the walk. This freshwater lake provides a habitat for many varieties of wetlands plants and animals.



4- Look carefully at the ground in front of you and notice the stump and rotting log of a large pine, as well as several large pines in the nearby area. These pines are reaching the end of their natural life span, and are much older than the younger pines first encountered on the beginning of the trail. This process is just another step in plant succession which occurs naturally in a forest. As the pines die out, hardwoods such as oaks or maples begin to replace them. The rotting log and pine stump return nutrients to the soil, providing food for growth of new plants which, in turn, provide food and shelter for animals. The space left by the fallen trees in the forest *canopy*, the high covering of branches over the forest floor, provides enough sunlight for young hardwoods to grow to maturity. Notice the small oak starting to grow in the shadow of the fallen pine.

5- The Elizabeth River has been used for fishing and hunting and as a water highway for travel for thousands of years. Native Americans traveled the river in dugout canoes similar in shape to those that cast off from the launch in front of you. On a nice day, you might see (or be!) someone fishing from the shore. Across the river is a healthy tidal wetlands marsh. The dominant species in this marsh are saltbushes and big cordgrass. The marsh provides a habitat for many organisms. Some use the area as nursery or feeding grounds, others migrate through in the spring and fall, while still others live there all year. The marsh provides many benefits to the adjoining watershed - land which drains to the river. If there is a flood, wetlands can slow the speed of the water, and store much more water than upland areas, preventing damage to the houses near the marsh and capturing pollutants. You may find it hard to imagine ocean-going vessels navigating this river, but remember that ships were much smaller and the river was much deeper than today. Some of the names now in use in the surrounding area owe their origin to the waterway, such as Kemps Landing, Whitehurst Landing, Pleasant Point, and Newtown.



At low tide you can see a small channel draining from the marsh straight across from the launch. These small streams interlace the marsh, acting like the veins and arteries which bring nutrients to the plants in the marsh. As they decay, the marsh plants, in turn, become food for animals living in the area. This decaying food source is called *detritus*.



6- In front of you is a mulberry tree (1). During colonial times, these trees were brought to America as they were the chief food source for silkworms. Unfortunately, the silkworms did not adapt very well to the local climate and the venture was a failure, but the mulberry thrived. Its berries became a favorite for jams and jellies, and are a delicacy for birds and small mammals in the park. The mulberry is a good example of an *exotic*, which are a plant or animal that are not native to an area. Other exotics you will see in the park include privet, starlings, common reed, and russian olive. To your left you will see a tall plant with a very prickly stem which is called devils walking stick (2).



7- The marshy area in front of you is part of the freshwater wetlands area which rims major portions of the shore of Turtle Lake. The freshwater lake and marsh ecosystem is very diverse, inhabited by many plants and animals. The shrubby plants you see in front of you extending into the lake are marsh hibiscus (1), which have a large pink blossom in early summer. Another shrub you will see is the wax myrtle (2), prized for its scented berries used in candle making. Also notice the needlerush, easily recognizable by its long and sharp pointed leaves. Continue up to the hill where you can catch a glimpse of the Elizabeth River in the distance. Mornings are a great time to stop here and observe the numerous birds in the lake or flying overhead. On a warm sunny day you may also catch a glimpse of some of the reptiles which crowd on the log in the lake to warm themselves, since reptiles are cold blooded. These reptiles give the lake its name. To continue the nature trail, go back to the main trail and turn right.

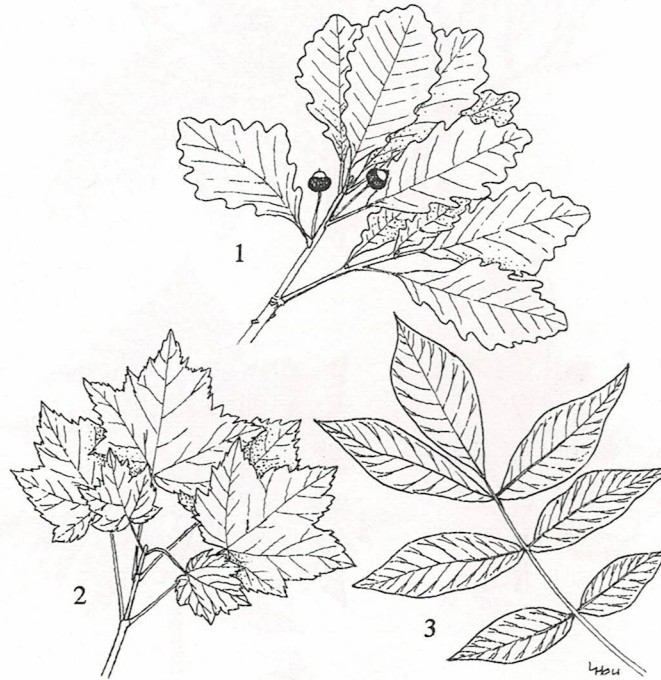


8- The river shoreline in front of you is eroding. This erosion is occurring because the high bank is being undercut by the natural channel of the river as it meanders closer to this bank than the opposite bank. The natural vegetation has been further removed from the area due to disturbance by humans, increasing erosion from the upland as rainfall runs down the bank to the river. Compare this side of the river to the far side, and observe the ability of the marsh grasses to hold and stabilize very fine sediment. In the future, it is hoped that this site will be stabilized and restored with vegetation, given the head start from a shoreline erosion control project using a very valuable wetlands plant called saltmarsh cordgrass. This plant is growing on a portion of the bank now. Saltmarsh cordgrass has high habitat value, and can help stabilize eroding shorelines. There have been many projects in Virginia Beach that have restored dunes grasses, wetlands and woodlands. Contact the City's Habitat Enhancement Committee for information on upcoming restoration projects.

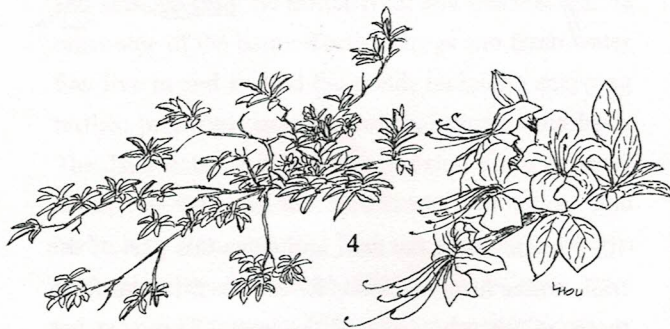
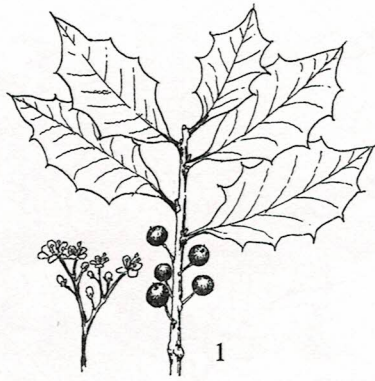
To help prevent future erosion caused by human activity, it is hoped that a dock for fishing access can be built, as well. There are also future plans to place an osprey nesting platform here on the opposite side of the river. You may catch a glimpse of an osprey or a hawk feeding on the marsh or river if you come here early in the morning. Behind you the river flows westward to Norfolk.



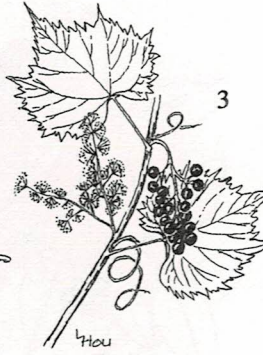
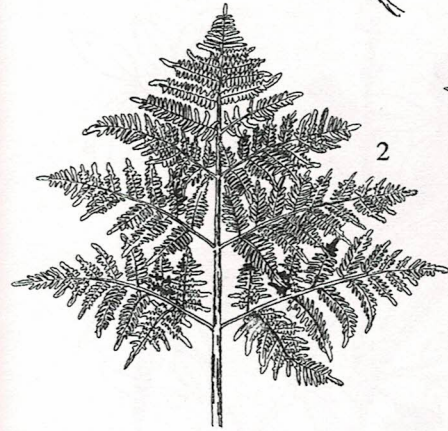
9- From this spot one can get a good view of Turtle Lake and its numerous coves. The manmade lake was originally created by building the earthen dam you are walking on and flooding a tidal pocket marsh. Originally used for farm purposes, since urban development occurred the lake has become the repository of urban stormwater runoff from adjacent streets, homes, driveways, and lawns. Unlike the Elizabeth River behind you, the water in the lake is fresh, providing a very different habitat for plants and animals than the saltier river and marshes on the other side of the dam. Turtles, frogs and fresh water fish live in and around the pond, including snapping turtles, bullfrogs, sunfish, bream, crappie, and bass. The lake acts as a trap for erosion from uplands areas, as well as for fertilizers, pesticides, and herbicides from lawns. The life span of a lake in nature is very short, and lakes in urban areas have even shorter life spans, due to the excess *nutrients*, or food sources, they receive from rainfall runoff. If too much fertilizer reaches the lake, you will begin to notice algae blooms, smelly water, and fish kills, since the fertilizers and other nutrients spur plant growth which uses up oxygen in the lake's water. Help keep this lake and others in Virginia Beach healthy by being a responsible and economically-wise property owner. For further information concerning environmentally-sound landscape practices, call the Virginia Beach Extension Office, Department of Agriculture, or the Department of Planning.



10- As you leave the dam and enter this part of the trail, notice how the plants look quite different from those on the other side of the lake. This area has undergone more plant succession and is known as an oak (1) - maple (2) - hickory (3) climax forest. The animals which frequent this forest are also different from those in the pine forest, for a greater abundance and diversity of food is available. This area is a hardwood forest, due to both the durability and difficulty of working with the wood, whereas pines are known as softwoods. See if you can keep a mental count of the varieties of plants you see in this area, and compare it to the variety you noticed in the pine forest - the difference is significant.



11- A diverse assortment of plants occupy the *understory* of the oak - maple - hickory forest. See if you can locate four of the most special understory plants in this area: holly (1), red bay (2), yellow or Carolina jasmine (3), and wild azalea (4). The presence of these plants are also strong indicators of the maturity and stability of the surrounding climax forest. Someday, if not disturbed by fire or man, the pine forest on the other side of the lake will begin to exhibit this same diversity of plant and animal life.



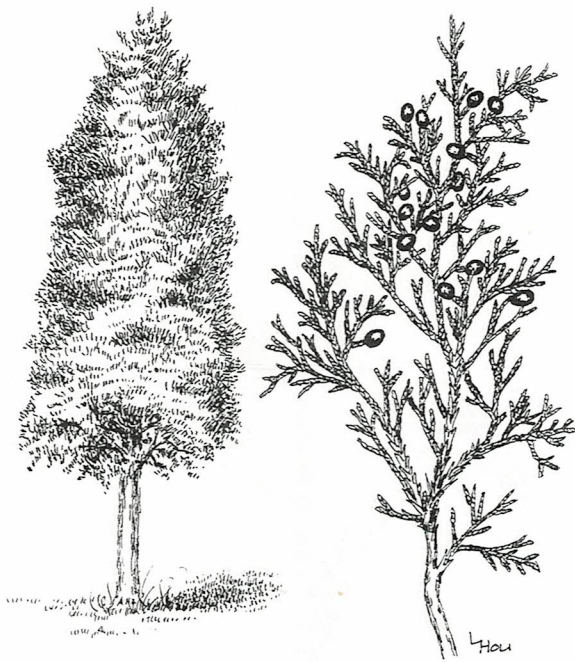
12- The dense growth of shrubs, or *thicket*, you see is made up of a plant called mountain laurel (1). At one time, this plant grew naturally in cool, well drained spots throughout the Elizabeth River watershed. Mountain laurel is most common in the southeastern United States at higher elevations, but isolated areas with the right *microclimate*, or mixture of sunlight, temperature and moisture, create the conditions which allow this beautiful plant to grow in the coastal plain. Look to see its fragrant white and pink clusters of blossoms in May. Also notice the plentiful ferns (2) on the ground in this area, along with vines of wild grapes (3). These grapes are related to those first encountered by Viking explorers to North America, who called the areas they discovered Vinland due to their bounty. English colonists found the same grapes upon first landing at nearby Cape Henry in 1607.



13- The low bushy plant in front of you is called a highbush blueberry, or huckleberry. This plant is a native to North America, and, when cultivated, grows blueberries that are used in pastries and desserts. Native North Americans looked forward to the annual fruiting of this plant, for its berries were a major portion of their diet in summertime. Animals are also quite fond of these berries, particularly birds and small mammals. Blueberries blossom in early spring, and the familiar shape of the berries can be seen by May.



14- From this point you can see the tops of a marsh plant called *phragmites*, or common reed. An exotic plant, which is native to the Persian Gulf region, this plant is capable of outcompeting other native marsh plants, and thrives in degraded areas suffering from erosion or pollution. While common reed does help stop erosion, it has little habitat or food value for animals which live in the marsh. As you leave this spot you will begin walking down a portion of an old road bed, which was probably used years ago when this area was still a working farm as a means of access to the river. Notice how plants have gradually reclaimed this area.

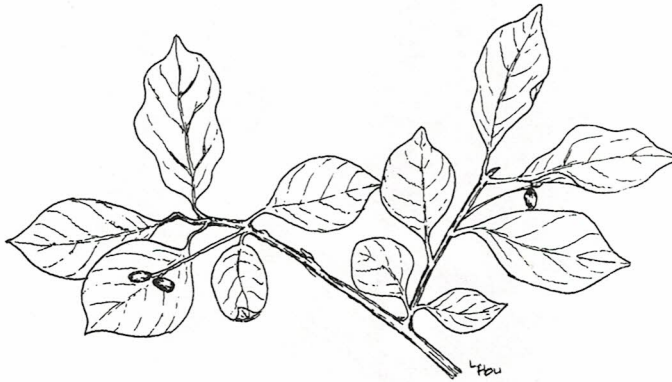


15- The large evergreen tree in front of you is an Eastern red cedar. These trees usually grow to this size in cleared areas. The tree probably marked the edge of the old road. Red cedar is a very durable wood, very aromatic and resistant to disease. Its wood was widely used to make fence posts in earlier times, instead of using creosote or salt treated timber, due to its resistance to rot and insect damage. Red cedar is often one of the first trees which will recolonize an old farm field.



16- In front of you an experiment is in progress. Notice the small cedar trees you see in this clearing. These cedars are different from the red cedars seen earlier on the trail. Known as Atlantic white cedars, these trees are globally *endangered* due to overharvesting for their valuable timber used in fencemaking and other durable outdoors materials. Once quite widespread in the middle Atlantic Coastal Plain region, these trees are now quite rare. Conditions are good to reestablish a small stand of these interesting plants on this site. Once mature, the dense stand they will form will help to give visitors a taste of what early colonists and loggers once saw in great abundance.

Immediately behind you on the bank of the lake is a black gum tree, regularly found in wetlands areas. In the fall it is easily identified by its bright red foliage. Berries from the black gum are a favorite food of many animals found in the park.

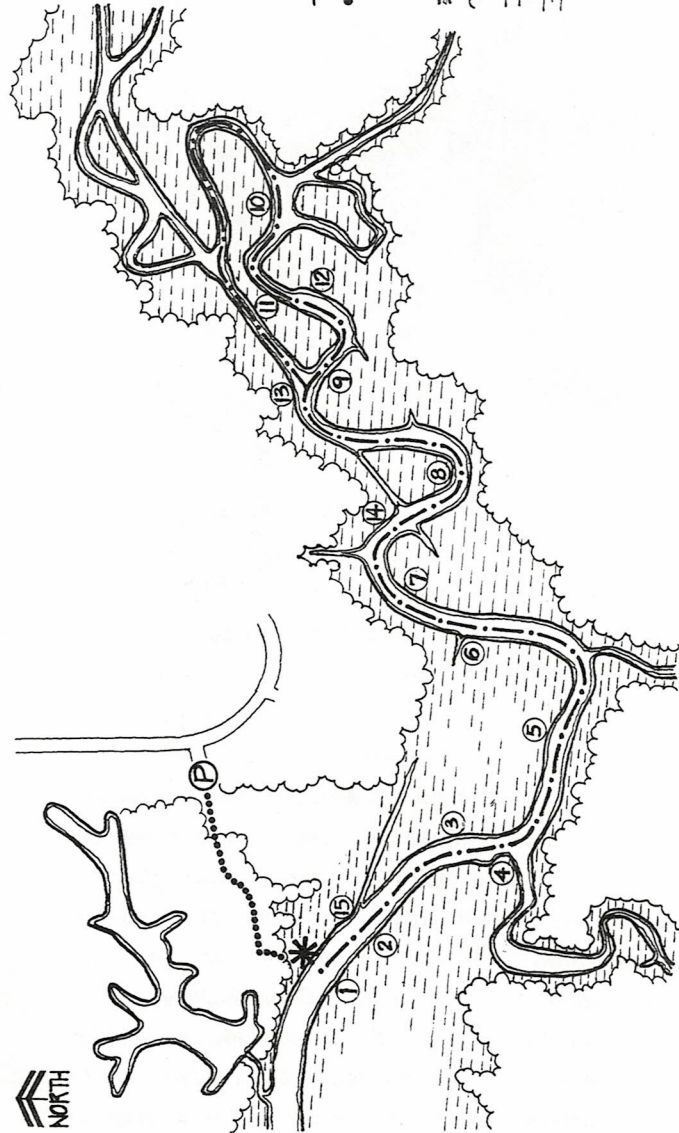


17- Just to your right you will notice the spillway which allows excess water, and pollution, to exit the lake and flow into the Elizabeth River. Disturbance caused by this discharge can be evidenced by the presence of phragmites, or reed grass, crowding out the other plants in the marsh. Notice how strong and resilient nature is in containing this disturbance and thriving in spite of these conditions, although the original character of the area has changed. As individuals take more responsible actions to safeguard the environment, perhaps these areas will recover more of their natural diversity and value.

CANOE TRAIL

LEGEND

- CANOE LAUNCH
- CANOE TRAIL
- NATURE TRAIL
- TRAIL MARKER
- STREET PARKING
- RIVER / LAKE
- TREE LINE
- STREET ACCESS
- WETLANDS

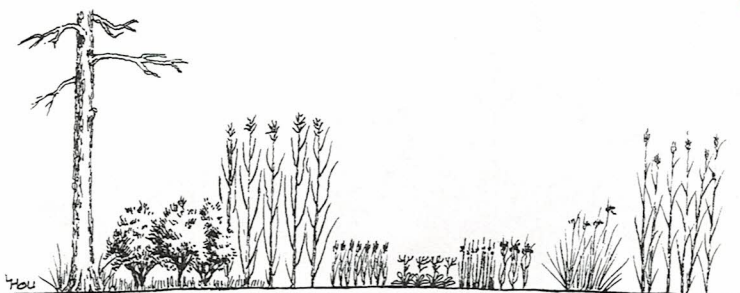




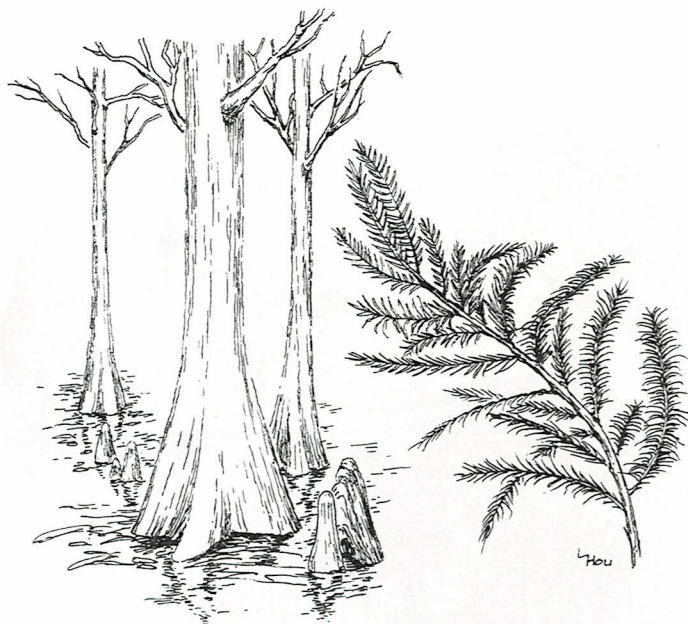
1- Two shrubs dominate the tidal marsh in front of you. These shrubs are known collectively as saltbushes, but really are two distinct plants - groundsel tree (1) and marsh elder (2). You can distinguish between the two by studying the arrangement of their leaves. Groundsel tree leaves alternate in position on the stem, while marsh elder leaves are opposite one another. Both plants provide considerable habitat and shelter for the many animals living in this wetlands area.



2- The mixture of plants in front of you is collectively called a big cordgrass community. Big cordgrass communities are one of the more valuable tidal wetlands types found in Virginia, due to their fairly high yield of organic matter which contributes to the marine food web during spring or flood tide conditions. Big cordgrass marshes are typically found in *brackish*, or low salinity waterways. These areas are most identifiable by the presence of big cordgrass, which grows up to eight feet tall, and has a seed head, or flower, which is made up of tightly arranged seeds. Do not confuse this plant with the exotic plant phragmites, or common reed, which has a feathery seed head. Big cordgrass communities are considered only slightly less valuable than their neighbor on the river - brackish water mixed communities.



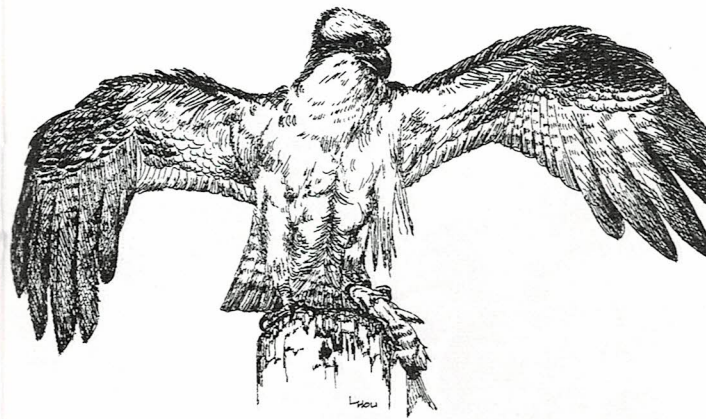
3- The brackish water mixed community is the other dominant tidal wetlands type found along the canoe trail. This community has a much more diverse mixture of plant species, with no single species or plant type dominating over half of the marsh. The greater diversity of plants results in a wide variation of *primary production*, or generation of plant material which can be converted to food by animals in the marsh. For this reason, brackish water mixed communities are considered one of the most valuable of tidal wetlands types. See if you can tell the subtle difference between the two community types - the brackish water mixed community is almost entirely void of big cordgrass plants. Brackish water mixed communities are excellent water quality control and flood buffers.



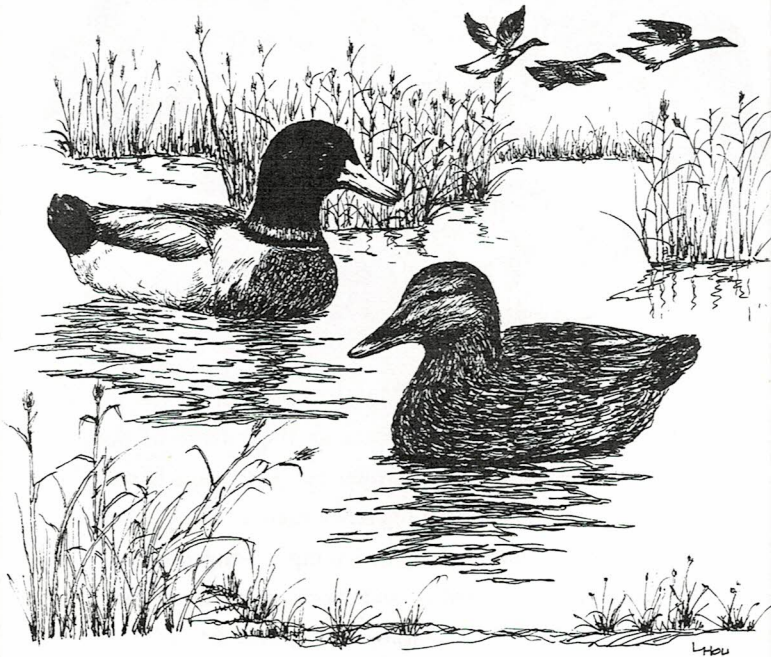
4- The creek in front of you, branching off of the main river, is known as Cedar Hill Canal. The uppermost portion of this creek as been channelized as a drainage canal, extending southward to eventually join Lake James, which overflows during storm events to the creek. Near the head of the remaining natural portion of the creek, one can see old bald cypress trees like the one pictured above, surrounded by small roots arching upward called cypress knees. It is theorized that the knees may be a means of support for these trees, or augment their roots in oxygen uptake. The uppermost reaches of the Eastern Branch of the Elizabeth River once contained many small stands of this majestic tree, which can live for 1,000 years or longer. Its wood was highly prized for shipbuilding, due to its smooth grain and resistance to rot and insect damage. Most of these trees were harvested long ago, yet they could make a comeback, especially if they are assisted in recovery by man. Small saplings of bald cypress can be planted in these upper reaches of the watershed to help restore some of the original diversity once seen in this area.



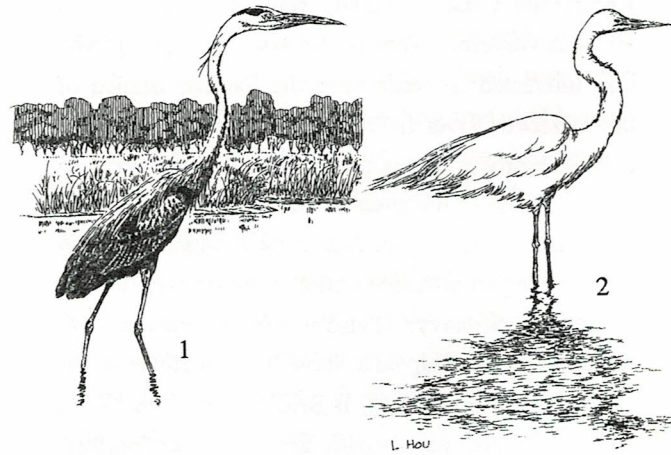
5- As you canoe through the marsh in the spring and summer, you will quite likely see one of the more colorful residents of the river - the red winged blackbird. The male is easiest to identify, with red shoulder patches and a golden buff border. The female is dusky brown in color above, with a heavily streaked breast and usually no red shoulder markings. Red wings are abundant in wetlands areas, and nest in the grasses and shrubs of the marsh, building their nests of woven reeds lined with fine grasses. Large flocks of these birds are sometimes seen on the river in fall and winter months as they migrate southward. Red wing blackbirds grow to about seven inches in size, feeding on seeds and insects found in the marsh, which it supplements with berries in season.



6- One of the most spectacular inhabitants of the river is the osprey. Sometimes called the fish hawk, ospreys are members of the hawk family. They grow to about two feet in length, having a wingspread of about six feet. Smaller and more streamlined than eagles, ospreys have a large black spot at the "elbow" of their wings. Their underside is almost entirely white, and they have brown to black patterned coloring over the rest of their bodies. Ospreys make massive nests of sticks and branches, often weighing several hundred pounds, on tall isolated trees, channel markers, or other platforms. Usually three eggs are laid in a nest, although the hatchlings often number only one or two. Ospreys make a dramatic sight when feeding by hovering over the water, setting their wings, and diving feet first with talons extended for fish. The birds often go completely under water while fishing, yet their close, firm, and slightly oily feathers keep them flightworthy, resulting in hardly a break in their flight pattern. Federally protected, ospreys are making a comeback in the area. There are future plans to place nesting platforms opposite the river access location and the wetlands restoration site.

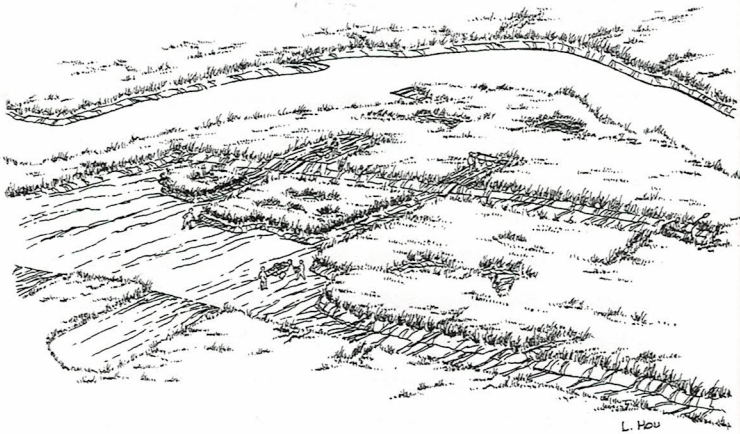


7- Mallards are a familiar sight in the wetlands and waters of the park. Growing up to approximately two feet in size, mallards are best identified by the male and its teal head and white neck ring, although both the male and female have a blue wing patch bordered on each side by white bars. Mallards and other surface-feeding ducks take off for flight in a vertical leap. While feeding, mallards tip forward on their heads in shallow water to eat aquatic plants and insects. The female lays between six to thirteen olive-colored eggs in late spring in a nest of reeds and grasses lined with her down on the ground in high grasses near water.



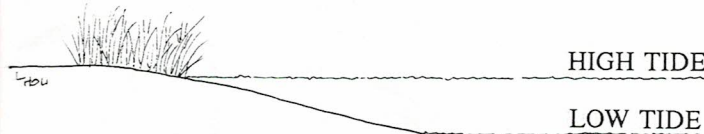
8- You will likely see two of the largest and most beautiful birds inhabiting the river on your trip. The great blue heron (1) is the largest dark-colored wading bird found in North America. Great blue herons are permanent residents of the area, easily identified by its long legs, bluish gray color, and long pointed head feathers. Growing up to thirty eight inches long, they are master fishermen, yet also feed on crustaceans, frogs, and mice. When startled, blue herons will take to flight with a slow, even wing beat. Blue herons nest in colonies, or *rookeries*, usually in old pine groves adjoining the waters and wetlands where they feed, building their nest from sticks and branches, though not as massive as those of the osprey. Try to paddle up as close as possible to one of these birds without disturbing it to observe its delicate yet in some ways primitive appearance, reminiscent of prehistoric flying reptiles. Very similar to great blue herons in feeding and nesting habits, the common or snowy egret (2) is a large, white wading bird with yellow beak and legs. These birds like to patrol a stretch of shoreline, feeding on small crustaceans and fish. They, too, will take to flight if startled, yet observe the graceful manner in which they take off in flight.

9- The small ditch that extends in front of you is a remnant of what was once the Kempsville Canal. Originally begun back in the early 1800's, the Kempsville Canal Company was chartered by then Virginia Governor Thomas Jefferson to a group who was interested in connecting the Eastern Branch of the Elizabeth River from what is now Kempsville to Lake Pembroke, then a tidal tributary to the Western Branch of the Lynnhaven River. Jefferson was very interested in the project due to its strategic potential of providing an alternate outlet to the Atlantic for the fledgling U.S. Navy. It also would provide access to Gosport Naval Shipyard (now the Norfolk Naval Shipyard in Portsmouth), if British forces blockaded the port of Hampton Roads at Old Point Comfort, where the Hampton Roads Bridge Tunnel is today. Work progressed such that a deep water channel was completed through the marsh surrounding you as far as Kemps Landing, probably in a manner similar to that shown.



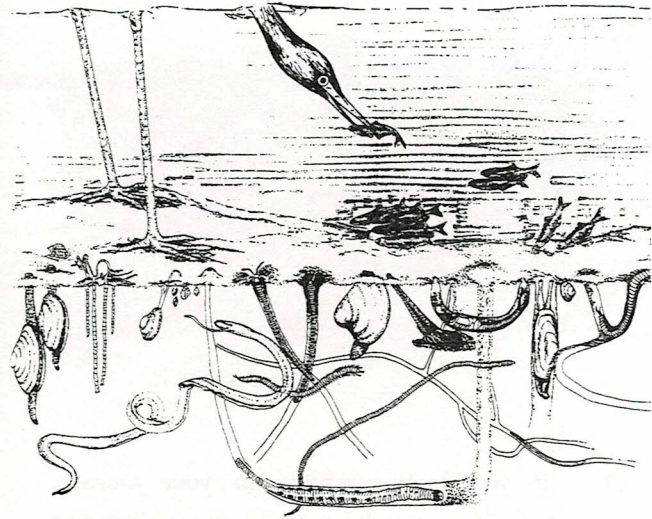
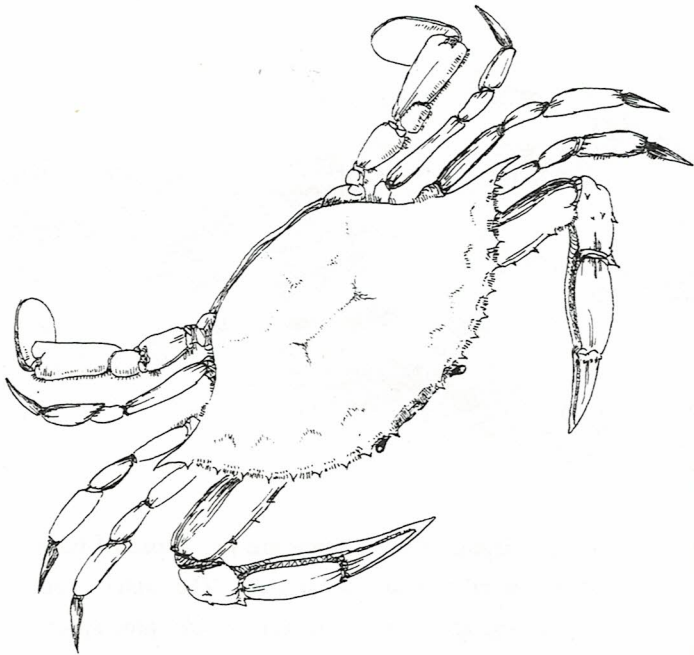
Excavation was in progress as far as the present intersection of Euclid Road and Cleveland Street at the onset of the War of 1812. After the war, the project fell into disarray, and was eventually abandoned prior to the Civil War.

Another company formed following the War of 1812 with the intention of extending a canal from Kemps Landing southeastward to the headwaters of the North River (now North Landing River) to provide a connection between the Eastern Branch and Currituck Sound. This North Landing Canal was more successful than the first, resulting in a usable canal which now can be traced as a major drainageway from Kempsville parallel to Salem Road to an area near North Landing Road and the Intracoastal Waterway. This canal, too, fell into disrepair with the subsequent opening of the Chesapeake and Albemarle Canal running from Great Bridge to the North Landing River. It is interesting to imagine how different this area would now be if the canals had remained viable, for the industrial development characteristic of the Southern Branch of the Elizabeth in Chesapeake would have probably occurred here.



10- In Virginia Beach, there are two types of tidal waters - wind tide and lunar tide. The waters you are canoeing are lunar tidal. *Lunar tides* are caused by the gravitational pull of the moon on the earth, and occur approximately two full cycles daily. The tides also cycle approximately once per month, running through a series of higher and lower ranges.

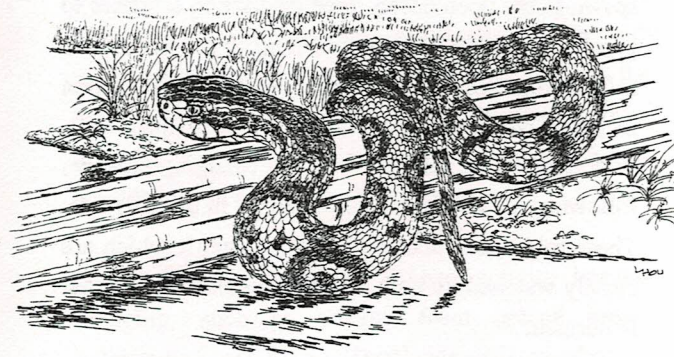
Wind tides, on the other hand, are a result of the action of prevailing winds in waters which have little, if any lunar tide influence. Accordingly, wind tides are very erratic and unpredictable. Lunar tides are greatly influenced by strong weather conditions, which can magnify or diminish normal conditions greatly. In the upper reaches of tidal waterways, like the conditions on this trail, tide conditions greatly influence the ability to navigate canoes and other watercraft. Make sure you consult a tide table or check daily conditions as provided by the National Weather Service before you begin your trip to avoid being stranded at low tide. In addition to affecting navigation and giving our region the nickname of Tidewater, lunar tides affect water quality, circulation, temperature, mixing, and feeding behavior by animals living in the estuary.



11- Look carefully down into the waters surrounding you and notice the fine silts and clays which compose the river bottom. This ooze, with its characteristic organic odor, is also an extremely important part of the ecology of a tidal wetlands. Mudflats, or nonvegetated tidal wetlands, are home to a wide assortment of worms and crustaceans which become the major food source for crabs and fishes which migrate in and out of the river. Not as mobile as their neighbors, these animals directly depend upon the food supplies from the decay of plants from the marsh, as well as the thin layers of algae which grow with each tide cycle on the surface of the mudflat. At low tide, you can see small fiddler crabs "harvesting" this bounty of algae, which is as productive in terms of generating food for the vitality of this ecosystem as the marsh itself.

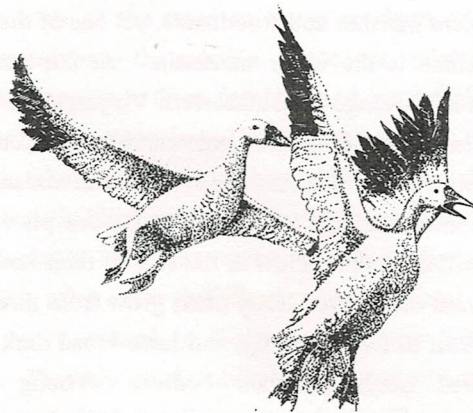


12- If you look carefully on your journey, particularly if it is early morning or evening, you may see one of the more animated residents of the river ecosystem - the raccoon. Raccoons, related to pandas, grow up to three feet long and can weigh up to twenty five pounds. Their faces, with a nose shaped like a fox, are best known by their characteristic black bandit mask. With long legs and strong claws, raccoons make excellent climbers. Raccoons often wash their food, which includes just about every animal in the area, in water before eating. They are good paddlers and frequently cross the river to feed in adjacent marshes. The female bears three to six young in April or May, and will continue to care for her young kits until early winter, when weaned. Raccoon tracks are often seen at low tide on the river, marking their path to the shore for a drink or a fish snack. An interesting bit of trivia concerning raccoons is that they were the mascot of the national Whig political party from 1838 to 1844. Perhaps their cunning was the rationale for this political honor!



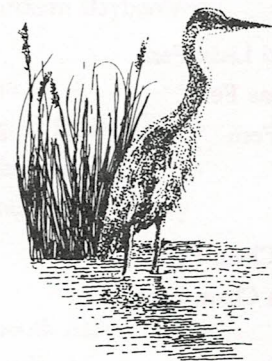
13- Many varieties of animals live in the river and adjacent marshes and woodlands, yet one of the most awesome is the water moccasin. At the northern limit of its range in southeastern Virginia, the water moccasin is one of three poisonous snakes found in the city, along with the copperhead and endangered canebrake rattler. Water moccasins are pit vipers, identified by the hollow in the side of their head just forward of the eye. They often grow from three and one-half to five feet long, and have broad dark olive colored bands on their bodies. Young water moccasins are born alive, not hatching from eggs. Unlike their nonpoisonous relatives, the water snakes, water moccasins move on top of the water when they swim. Though not seen as desirable by humans, water moccasins play an important role in helping control populations of rodents in the river ecosystem, including mice and rats. Should you see a water moccasin on your trip, give it a wide berth and let it proceed on its way, remembering you are the visitor to its habitat.

14- In a tidal estuary like the one you are now in, there are two primary types of fish species. *Anadromous* fish spawn in the upper reaches of the estuary, then live their adult lives primarily in the open ocean and return to spawn in the same estuary where they were born. Examples which inhabit local waters include shad and blueback herring. Fish that spawn in the open ocean, then migrate to estuaries to grow and mature, finally returning to the ocean, are called *catadromous* fish. Examples found in this area include spot, croaker, bluefish, and striped bass. Fish, like birds, migrate with the changing seasons, following the changing temperatures in the currents. These migrations account for "fish runs", which are closely watched by both commercial and recreational fishermen.



15- The ditch in front of you running inland from the river was originally dredged from the marsh, and was the outfall location from the sewage treatment plant serving the Carolanne Farm neighborhood before the plant was closed and the property became the present park. Notice how over time this area has filled with sediment and become more stabilized with the plants of the adjacent marsh. Without further disturbance, this area will eventually fill in with sediments to the point that the marsh again covers the area. The ability of an ecosystem to recover from disturbances, reestablishing itself and regaining a new equilibrium is called its *resilience*.

Other affects induced by human activity besides dredging, such as erosion from upland areas, bulkheading, and filling of wetlands, collectively alter the wetlands ecosystem. Individually, these affects are often minimal, but the *cumulative* or combined affect of all of these activities can seriously alter the original ecosystem. In these instances, the ability of the ecosystem to reestablish equilibrium is severely stressed, yet its resilience will allow it to find a new yet different balance.



PLANTS AND ANIMALS CHECKLIST

This checklist includes plants and animals which are known to inhabit or visit the Hampton Roads region. This information was obtained from Seashore/First Landing State Park and Natural Area.

Specific observations have not been confirmed at Carolanne Farm Neighborhood Park. Please assist us in refining this checklist by noting and reporting any confirmed observations so that future editions of this booklet may more accurately reflect conditions in the park.

Fern and Fern Allies

Lycopodiaceae

___ Running-pine

Osmundaceae

___ Cinnamon Fern

___ Royal Fern

Pteridaceae

___ Bracken Fern

Aspidiaceae

___ Lowland Lady Fern

___ Christmas Fern

___ Marsh Fern

Blechnaceae

___ Netted Chain Fern

___ Virginia Chain Fern

Aspleniaceae

___ Ebony Spleenwort

Polypodiaceae

___ Resurrection Fern

Trees

Pinaceae

___ Shortleaf Pine

___ Long-leaf Pine

___ Pond Pine

___ Loblolly Pine

___ Scrub Pine

Taxodiaceae

___ Bald Cypress

Cupressaceae

___ Atlantic White Cedar

___ Red Cedar

Salicaceae

___ Ward Willow

___ Black Willow

Myriaceae

___ Common Waxmyrtle

___ Black Bayberry

___ Northern Bayberry

Juglandaceae

___ Pignut Hickory

___ Pale Hickory

___ Mockernut Hickory

Betulaceae

___ Smooth Alder

___ Ironwood

___ Hornbeam

Fagaceae

- ___ Chestnut
- ___ Eastern Chinquapin
- ___ Beech
- ___ White Oak
- ___ Scarlet Oak
- ___ Spanish Oak
- ___ Swamp Spanish Oak
- ___ Sand Oak
- ___ Turkey Oak
- ___ Laurel Oak
- ___ Scrubby Post Oak
- ___ Blackjack Oak
- ___ Basket Oak
- ___ Water Oak
- ___ Willow Oak
- ___ Chestnut Oak
- ___ Post Oak
- ___ Black Oak
- ___ Live Oak

Ulmaceae

- ___ Southern Lowland Hackberry

Moraceae

- ___ Red Mulberry

Magnoliaceae

- ___ Tulip-tree
- ___ Bull Bay
- ___ Sweetbay Magnolia

Annonaceae

- ___ Tall Pawpaw

Laurelaceae

- ___ Redbay
- ___ Sassafras

Hamameildaceae

- ___ Common Witch-Hazel
- ___ Sweetgum

Plantanaceae

- ___ Sycamore

Rosaceae

- ___ Oblongleaf Juneberry (Shadbush)
- ___ Hawthorns sp.
- ___ Crabapple
- ___ Common Apple
- ___ Chickasaw Plum
- ___ Peach
- ___ Black Cherry

Fabaceae

- ___ Black Locust

Aquifoliaceae

- ___ Inkberry
- ___ American Holly
- ___ Common Winterberry
- ___ Yaupon

Aceraceae

- ___ Red Maple
- ___ Sugar Maple

Nyssaceae

- ___ Tupelo
- ___ Black Gum
- ___ Sour-gum

Cornaceae

- ___ Flowering Dogwood

Ericaceae

- ___ Sourwood

Ebenaceae

___ Persimmon

Symplocaceae

___ Sweet leaf

Oleaceae

___ Osmanthus

Bignoniaceae

___ Catawba-Tree

Mammals

___ Southern Short-tailed Shrew

___ Southeastern Shrew

___ Pygmy Shrew

___ White-footed Mouse

___ Pungo Mouse

___ House Mouse

___ Rice Rat

___ Star-nosed Mole

___ Eastern Mole

___ Gray Squirrel

___ Southern Flying Squirrel

___ Eastern Cottontail

___ Marsh Rabbit

___ Nutria

___ Opossum

___ Raccoon

___ Gray Fox

___ Little Brown Bat

___ Silver-haired Bat

___ Red Bat

___ Evening Bat

___ Eastern Pipistrelle

___ Keen's Bat

Reptiles

Lizards and Skinks

___ Southeastern Five-lined Skink

___ Broad-headed Skink

___ Five-lined Skink

___ Ground Skink

___ Fence Lizard

___ Six-lined Racerunner

Turtles

___ Eastern Painted Turtle

___ Red-Bellied Turtle

___ Yellow-Bellied Turtle

___ Spotted Turtle

___ Common Snapping Turtle

___ Musk Turtle

___ Eastern Mud Turtle

___ Striped Mud Turtle

___ Eastern Box Turtle

Venomous Snakes

___ Cottonmouth (Water Moccasin)

___ Copperhead

Non-Venomous Snakes

___ Northern Watersnake

___ Red-Bellied Watersnake

___ Eastern Ribbon Snake

___ Southern Ringneck Snake

___ Eastern Hognose Snake

___ Eastern Worm Snake

___ Northern Scarlet Snake

___ Rough Green Snake

___ Eastern Mud Snake

___ Northern Black Racer

___ Black Rat Snake

___ Scarlet Kingsnake/Milk Snake intergrade

Amphibians

Frogs and Toads

- ___ Leopard Frog
- ___ Green Frog
- ___ Bullfrog
- ___ Carpenter Frog
- ___ Spring Peeper
- ___ Green Treefrog
- ___ Squirrel Treefrog
- ___ Gray Treefrog
- ___ Southern Cricket Frog
- ___ Narrow-mouthed Toad
- ___ Southern Toad

Salamanders and Newts

- ___ Two-toed Amphiuma
- ___ Coastal Plain Slimy Salamander
- ___ Marbled Salamander
- ___ Four-toed Salamander
- ___ Red-spotted Newt

Birds

Podicipedidae

- ___ Horned Grebe
- ___ Pied-Billed Grebe

Phalacrocoracidae

- ___ Double-Crested Cormorant

Pelicanidae

- ___ Brown Pelican

Rynchopidae

- ___ Black Skimmer

Charadriidae

- ___ Semipalmated Plover
- ___ Wilson's Plover
- ___ Kildeer
- ___ Black-Bellied Plover

Ardeidae

- ___ Great Blue Heron
- ___ Green Heron
- ___ Little Blue Heron
- ___ Common Egret
- ___ Snowy Egret
- ___ Black-Crowned Night Heron
- ___ Yellow-Crowned Night Heron
- ___ American Bittern

Cathartidae

- ___ Black Vulture
- ___ Turkey Vulture

Accipitridae

- ___ Sharp-Shinned Hawk
- ___ Cooper's Hawk
- ___ Red-Tailed Hawk
- ___ Red-Shouldered Hawk
- ___ Bald Eagle
- ___ Northern Harrier (Marsh Hawk)
- ___ Osprey
- ___ American Kestrel

Anatidae

- ___ Mallard
- ___ Black Duck
- ___ Wood Duck
- ___ Bufflehead
- ___ Hooded Merganser
- ___ Red-Breasted Merganser

Rallidae

___ King Rail

Odontophorinae

___ Northern Bobwhite

Scolopacidae

___ Greater Yellow Legs

___ Lesser Yellow Legs

___ Solitary Sandpiper

___ Willit

___ Spotted Sandpiper

___ Ruddy Turnstone

___ Common Snipe

___ Short-Billed Dowitcher

___ Sanderling

___ Semipalmated Sandpiper

___ Least Sandpiper

___ Baird's Sandpiper

___ Pectoral Sandpiper

___ Dunlin

Laridae

___ Herring Gull

___ Ring-Billed Gull

___ Laughing Gull

___ Bonaparte's Gull

___ Gull-Billed Tern

___ Common Tern

___ Least Tern

___ Royal Tern

Columbidae

___ Rock Dove

___ Mourning Dove

Caprimulgidae

___ Chuck-will's-widow

___ Common Nighthawk

Cuculidae

___ Yellow-Billed Cuckoo

Strigidae

___ Eastern Screech Owl

___ Great-Horned Owl

___ Barred Owl

Apodidae

___ Chimney Swift

Trochilidae

___ Ruby Throated Hummingbird

Corvidae

___ Blue Jay

___ Common Crow

___ Fish Crow

Alcedinidae

___ Belted Kingfisher

Picidae

___ Common Flicker

___ Pileated Woodpecker

___ Red-Bellied Woodpecker

___ Red-Headed Woodpecker

___ Hairy Woodpecker

___ Downy Woodpecker

Tyrannidae

___ Eastern Kingbird

___ Great Crested Flycatcher

___ Eastern Phoebe

___ Acadian Flycatcher

___ Eastern Wood Pewee

Certhiidae

___ Brown Creeper

Hirundinidae

- ___ Tree Swallow
- ___ Barn Swallow
- ___ Purple Martin

Paridae

- ___ Carolina Chickadee
- ___ Tufted Titmouse

Sittidae

- ___ White Breasted Nuthatch
- ___ Red Breasted Nuthatch
- ___ Brown Headed Nuthatch

Troglodytidae

- ___ House Wren
- ___ Winter Wren
- ___ Carolina Wren

Mimidae

- ___ Mockingbird
- ___ Gray Catbird
- ___ Brown Thrasher

Turdidae

- ___ American Robin
- ___ Wood Thrush
- ___ Hermit Thrush
- ___ Veery
- ___ Eastern Bluebird

Poliioptillidae

- ___ Blue-Gray Gnatcatcher

Sylviidae

- ___ Golden-Crowned Kinglet
- ___ Ruby-Crowned Kinglet

Bombycillidae

- ___ Cedar Waxwing

Sturnidae

- ___ Common Starling

Vireonidae

- ___ White-Eyed Vireo
- ___ Red-Eyed Vireo

Parulidae

- ___ Black and White Warbler
- ___ Prothonotary Warbler
- ___ Worm-Eating Warbler
- ___ Orange-Crowned Warbler
- ___ Northern Parula Warbler
- ___ Yellow Warbler
- ___ Black-Throated Blue Warbler
- ___ Yellow-Rumped Warbler
- ___ Black-Throated Green warbler
- ___ Yellow-Throated Warbler
- ___ Blackpoll Warbler
- ___ Pine Warbler
- ___ Prairie Warbler
- ___ Palm Warbler
- ___ Ovenbird
- ___ Louisiana Waterthrush
- ___ Kentucky Warbler
- ___ Common Yellow Throat
- ___ Yellow Breasted Chat
- ___ Hooded Warbler
- ___ American Redstart

Ploceidae

- ___ House Sparrow

Thraupidae

- ___ Scarlet Tanager
- ___ Summer Tanager

Icteridae

- ___ Bobolink
- ___ Eastern Meadowlark
- ___ Red-Winged Blackbird
- ___ Orchard Oriole
- ___ Northern Oriole
- ___ Boat-Tailed Grackle
- ___ Common Grackle
- ___ Brown Headed Cowbird

Fringillidae/Emberizidae

- ___ Cardinal
- ___ Indigo Bunting
- ___ Purple Finch
- ___ American Goldfinch
- ___ Rufous-Sided Towhee
- ___ Savannah Sparrow
- ___ Dark-Eyed Junco
- ___ Chipping Sparrow
- ___ Field Sparrow
- ___ White-Throated Sparrow
- ___ Fox Sparrow
- ___ Swamp Sparrow
- ___ Song Sparrow

Freshwater Fish

- ___ Mud Sunfish
- ___ Mud Minnow
- ___ Flier
- ___ Bowfin
- ___ Blue-Spotted Sunfish

Report checklist confirmations to:

Virginia Beach Department of Planning
 Environmental Management Center
 Municipal Center
 Virginia Beach, VA 23456
 (757) 427-4621
 ATTENTION: Clay Bernick

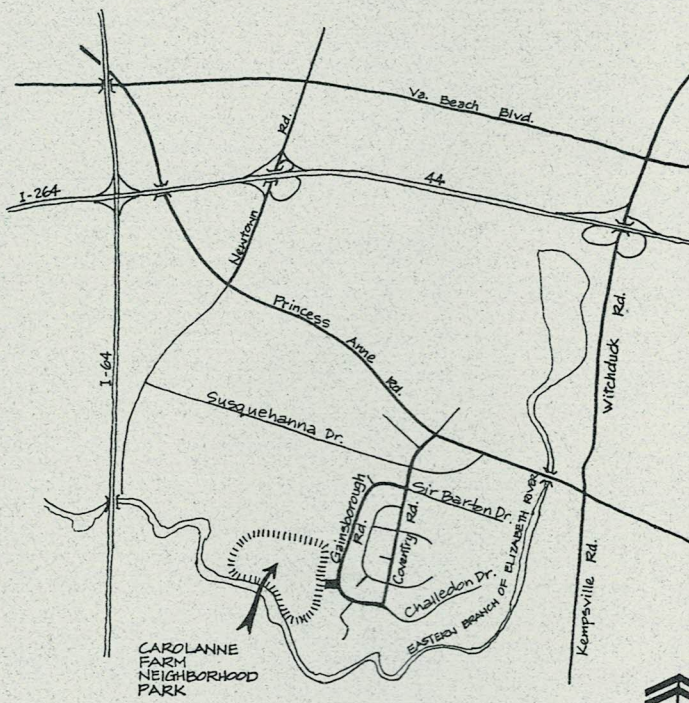
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LOCATION MAP



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