Friends of MacArthur Beach State Park
" An Island in Time"

Dear Teachers:

We are delighted that you have chosen to bring your 3rd grade students to John D. MacArthur Beach State Park.

The goal of this field experience is to instill in the students, an understanding and appreciation of coastal Southeast Florida's plant and animal communities. This program is designed specifically for third graders. **The program will begin promptly at 10 AM and is approximately 90 minutes in duration.** This does not include time for lunch. It is taught by trained volunteers and /or park staff and consists of three parts:

1. A nature walk on the Satinleaf trail.
2. Word search and crossword puzzles.
3. Discussion of tree rings and growth, along with a leaf identification game.

At the conclusion of the field trip, each student may enjoy receiving a **"You are Tree-mendous" certificate**. A copy of the certificate is enclosed in this packet, if you wish to use it. Along with the certificate are pre-field trip ideas that can be used to prepare the children for the things they will see and learn as they walk through the park.

In this packet, please find the following:

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

This program will supplement the following third grade instructional science objectives:

1. Identify the major parts of green plants and describe functions of each part: root, stem, and leaf.
2. Describe conditions necessary for plant growth.
3. Recognize that plants produce all food directly or indirectly.
4. Identify the uses of plants other than for food.

To make this an enjoyable field trip for teachers, students and our volunteers, please follow these guidelines:

- Please have each student wear a nametag. Please dress appropriately and ask students to wear comfortable walking shoes. At certain times of the year, mosquitoes can be prevalent. Please have your students prepare accordingly.

- When you arrive at the park, your class will be divided into separate groups with a volunteer staff member assigned to lead the group. **You must provide at least one teacher per class and you must have at least one chaperone per 10 students**.

- **Chaperones will be responsible for all discipline.** This is essential for the success of the field trip. Please remind all chaperones of this the day of the trip.

- Please contact the Nature Center (624-6952) if there is a change in your field trip plans (cancellation, increase or decrease in the number of students, buses are running late, etc.)

- If the weather is threatening (rain, lightning, thunderstorms) there will be no nature walks given. Rain dates will be available for classes that are canceled due to weather conditions. Contact the Nature Center for a new date and time.

- Restrooms and water fountains are available at the site of the field trip. After you eat lunch, you may wish to walk your children to the beach. There are no lifeguards on the beach and the walk would be done on your own, without guides. The total length of the walk is approximately three quarters of a mile.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

Entrance fees will be waived if a letter from the school principal on school letterhead is faxed to the park at least two weeks prior to your arrival. Please address the letter to park manager Terence W. Coulliette and present a copy upon your arrival. This letter must state that the park visit is for educational purposes, rather than purely recreational.

The personnel of John D. MacArthur Beach State Park look forward to your visit. We will do our best to ensure that your field trip will be an enjoyable learning experience.

Sincerely,

Arthur R. Carton
Park Services Specialist

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

INTRODUCTION TO THE PARK AND THIS PROGRAM

Welcome to John D. MacArthur Beach State Park. The Jeaga Indians inhabited this land for thousands of years. More recently, visitors have been coming to the park since the early 1940's when servicemen from nearby Morrison Field would visit with their families. The state park was established in the early 1980's, through the foresight and generosity of John D. MacArthur and the MacArthur Foundation. Park facilities were opened full time in 1989. Since the early 1990's, volunteers and staff have been providing school tours for kindergarten through fourth grade students.

GRADE SCHOOL EDUCATIONAL PROGRAMS

Our school tours focus on the natural communities of the park and the plants and animals that inhabit them.

Third grade students will start their day at the North Pavilion. Upon arrival at 10:00 a.m., there will be a fifteen minute introduction to a hardwood hammock. Following the introduction, students will be divided into groups and complete all the activities. There will be a three-quarter mile walk on the Satinleaf Trail, ident-a-leaf board game, crossword puzzle and a tree ring activity. The program ends at approximately 11:30 a.m. Activities are focused on the plant life at the park and life within the hardwood hammock. If classes would like to visit our beach, they must do so on their own time. Please be advised that there are no lifeguards on our beach.

Kindergarten, first, second and fourth grade students meet at the park's Nature Center at 10:00 a.m. and receive a walking tour of the park focusing on the four communities within the park. Students walk across a quarter mile boardwalk through a hardwood hammock, over the dune and onto our beautiful beach. Activities within the Nature Center include a tour of the exhibits, featuring a live juvenile loggerhead sea turtle, snake exhibits, hermit crabs and various aquariums and historical displays. Fourth grade students will also complete a worksheet based on the information learned in the Nature Center. Kindergarten through second grade students will participate in a fifteen minute "Who Am I" guessing game at the Nature Center.

Thank you for coming to John D. MacArthur Beach State Park. The park staff would like for your visit to be as fun and educational as possible. If you have any questions or comments please contact Park Services Specialist, Art Carton at (561) 624-6970., Art.Carton@dep.state.fl.us

FIELD TRIP & STUDENT SAFETY RULES

Thank you for choosing to come to John D. MacArthur Beach State Park. We would like for you to review a few of these safety rules with your students to make your trip both safe and fun.

Please review these rules before your visit.

To enjoy working outside without getting hurt, always remember the following safety rules

1. Outdoors is a place to learn, just like your classroom.
2. Listen carefully and follow directions.
3. Stay with your group.
4. Do not touch plants or animals without permission.
5. Watch where you are walking and stay on the trail
6. Stay away from debris on the beach.
7. Do not get wet while walking on the beach.

Remember:
This is a state park. All the plants and animals are protected by law.

FIELD TRIP ITEMS TO BRING

Name Tags
A big help to the school tour guides and park staff

Lunch
Bring food in recyclable reusable containers lunch may be eaten at the Nature Center Amphitheater and the North Pavilion for the third grade field trip

Appropriate Dress
Walking shoes and sun screen

Insect Repellent
There may be no-see-ums and mosquitoes present. Parents or teachers are allowed to apply repellent not park personnel

Money (optional)
Gift shop items are as low as a dollar and all the profit goes towards supporting the programs at the park

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

PRE-TRIP ACTIVITIES

Nature Area Scavenger Hunt

Take your class out to the school's nature area to look for the following:

- An animal's home
- Something an animal eats
- Something man made
- Something rough
- Something smooth
- Something you think is beautiful

Grow a Sprout

Fill a Styrofoam cup with a soil mixture or sand. Plant grapefruit seeds or other citrus fruits such as lemons, limes or oranges. As the seeds grow, discuss how seeds develop and what the seedlings need in order to grow. How are these the same or different from what makes us grow?

Leaf Attributes
Gather leaves from the school grounds
Discuss texture, size, shape and color.
Ask what is the same or different about the group of leaves.

Nature Rubbing

Collect natural materials with a variety of textures

You may either press these materials into clay or Plaster of Paris to make an impression.

You may also lay butcher paper over the materials and rub the side of a crayon up and down the paper to create an artistic rendering.

NATURAL COMMUNITIES OF JOHN D. MacARTHUR BEACH STATE PARK

Except for Hawaii, Florida contains more kinds of plants and animals than any other state. Plants and animals found living together in the same area form a community. The park contains four main natural communities or habitats. What plants and animals inhabit these communities is determined by many factors such as climate, soil, hydrology and fire frequency. Habitats provide food, water and shelter to the animals that live there.

Maritime Hammock

Hammock is an Indian word that means “shady place”. The maritime hammock includes a thin, intermittent strip of vegetation behind the beach dune and a mature hammock between A-1-A and Lake Worth Cove. The main portion of the hammock includes many large tropical trees like strangler fig and mastic, and some temperate ones like live oak. There are also satinleaf trees, a small fresh water depression with pond apple and a few scattered remnant slash pines. The hammock also contains numerous species of invasive exotic plants, with Brazilian pepper being the biggest threat.

Estuary

The estuary at John D. MacArthur Beach State Park is a small cove off the northern portion of Lake Worth. The water in the estuary is a mixture of salt and fresh water. Conditions in this community are always changing. Water levels rise and fall with the tide. The water temperature changes, as does the salinity. Organisms that can survive the variable conditions of an estuary flourish in the nutrient-rich waters. Some of the inhabitants of this system include oysters, fiddler crabs, mullet, checkered puffers and manatees.

Beach Dune

This community is narrower and steeper at the north end of the park, wider and flatter at the southern end. The tall, extensive dunes represent one of the best examples of this community in South Florida. Former dune blowouts have been repaired over time, but beach erosion threatens this community. The planting of sea oats to capture sand may help alleviate some of this threat.

Anastasia Limestone Rock Reef

This community was formed more than 125,000 years ago. The reef is limestone as opposed to those made of coral reefs found mostly south of the park. Many species of marine animals inhabit the reef. Some of the more spectacular are parrotfish, barracuda, damsel fish and loggerhead sea turtles. The reef stretches along the 1.6 miles of beach within the park’s boundary. Unlike many coral reefs in the Florida Keys, the reef is visible from the shoreline and can be easily reached with a mask and snorkel.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

THE HAMMOCK

Hammock is an Indian word that means “shady place”. The maritime hammock includes a thin, intermittent strip of vegetation behind the beach dune and a mature hammock between A-1-A and Lake Worth Cove. The main portion of the hammock includes many large tropical trees like strangler fig and mastic, and some temperate ones like live oak. There are also satinleaf trees, a small fresh water depression with pond apple and a few scattered remnant slash pines. The hammock also contains numerous species of invasive exotic plants, with Brazilian pepper being the biggest threat.

The hammock is cool, green and shady. It is soft humid, quite different from the hot, windy dry and salty beach environment. So----the leaves of most of the hammock plants are broad or compound to catch the sun.

PLANTS YOU WILL SEE IN THE PARK

Cabbage Palm –The State Tree of Florida

This palm is one of 11 palms native to Florida. The fruit is small, round and black. The Native Americans turned the dried fruit into a course meal with which they made bread. Another part of the tree that is eaten is the terminal bud or center of the tree. This is either cooked or eaten raw.

Caper

A shrub with rounded leaves and new leaves that emerge folded in half. The underside of the leaf has a distinctive covering of scales. This gives the leaf a silvery, rough textured appearance.

Coin Vine

Also called Fish Poison, a trailing shrub common in hammocks, beaches and estuaries. Ovate, pointed leaves are large and leathery; seedpods are round and flat, about the size of a quarter. Used by coastal Indians, the leaves and bark contain rotenone which paralyzes fish gills causing them to suffocate and float to the surface for harvesting.

Great Land Crab

The big holes at the base of the mangroves are made by Cardisoma, the big, gray-blue and somewhat dignified land crab highly prized as food in the Bahamas and West Indies.

Gumbo Limbo

This tree is often called the tourist tree because of its red peeling bark. The name Gumbo Limbo is of African origin. The wood is soft and light weight and was once used to make carousel horses. Another name for this tree is the living fence post. Branches stuck into the ground to make fences will begin to sprout.

Live Oak
Unlike most other oaks this tree keeps it leaves all year round. Native Americans used the acorns to make a porridge. Live oaks were very important in the ship building industry.

Mastic
This tree is known as the jungle plum because of its fruit, which is olive shaped, and has a yellow skin. The sweet tasting fruit is very sticky and glues a person's lips together after eating a few of them. Leaves are distinguishable by their wavy margins and are a bright shiny green above and a yellow-green below. Mastics are valuable timber trees. The lumber is very heavy and strong and is used in cabinet making and boat building.

Mulberry
The fruits of this tree are dark purple when ripe and have a blackberry-like flavor. This was an important food for the Native American Indians. Now the fruits are eaten raw or made into juice, jams and pies.

Paradise Tree
The leaves of this tree are dark green above and pale below. On the underside of the leaves are short, soft hairs, which make the leaves, feel like velvet. The wood has been used for cabinetry, matches and fuel.

Pigeon Plum
This tree is related to the sea grape and has a similar appearance. The Native Americans ate the fruit of this tree but it was not as tasty as the Sea Grape.

Poison Ivy
Almost all the parts of this plant are toxic. Poisoning may occur from contact with the plant or from touching clothes or animals that have touched the plant. The sap on the clothing may remain potent for months. It is estimated that 3 out of every 4 people are sensitive to poison ivy.

Red Bay
This tree can reach a height of 60-70 feet. The leaves can be used fresh or dried to flavor meat, poultry, soups and stews.

Satinleaf
The Satinleaf tree is in the same plant family as the sapodilla. Chikle, the basic raw material for making chewing gum, is obtained from the sapodilla. Fruit from the Satinleaf is dark purple and olive shaped. The fruit is used by children in the West Indies as chewing gum.

Sea Grape
Competing for sunlight in the hardwood hammock this tree grows large and very tall. The large leathery leaves also enable the sea grape to thrive in the harsh,

salt and sand scoured dune habitat, where it grows as a low shrub. The tasty fruit, which ripens in the fall, makes a delicious jelly.

Strangler Fig
This tree is pollinated by wasps. The flowers of this tree grow inside of the fruit, because of this the wasps must wiggle their way into the developing fig to pollinate them. A Pregnant wasp will crawl in a hole at the end of the fruit and lay her eggs in the female flowers. While doing this she scatters pollen over stigmas from her pollen sacs. After laying her eggs she dies. When the male flowers inside the fruit are mature the wasps are ready to hatch. The hatched males impregnate the females and chew a hole in the fruit to escape. After this the females load up their pollen sacs and fly off to begin the cycle again, while the males fall to the ground and die. After the wasps leave, the fig changes color to attract birds, which eat the fruit and disperse the seeds.

Stopper
This tree can be found by following your nose. The tree gives off a musky, skunk-like odor. The Native Americans used this tree to make a medicinal tea to treat diarrhea. Thus the name stopper.

Wild Lime
This is a member of the citrus family (pick a leaf and crush it to pass around thegroup to smell) It is very aromatic. The oils are stored in tiny pockets called pellucid dots, in the leaf. The wood is prized for cabinetry. Dark red heartwood contrasts with bright yellow sapwood.

BIRDS YOU MAY SEE IN OUR PARK

Great Blue Heron

1. Lean gray bird, blue white head, long streaming, black feathers going through eye past head. May stand 4 feet tall.
2. The bill is dagger –like and pale yellow.
3. Creeps through water in slow motion.
4. Favorite meal is fish, crabs, and most tiny animals.
5. Flies with neck pulled in.

Little Blue Heron

1. One half size of the GREAT BLUE HERON
2. Found wading near mangroves looking for small aquatic life.
3. Flies with neck pulled in.
4. Watch for him near the bridge, he may be looking at you!

Great Egret

1. White in color and nearly as large as the GREAT BLUE HERON. Its legs are black. (If you think you see this bird with yellow legs it's the GREAT WHITE HERON.)
2. Large yellow beak, black legs and feet.
3. When feeding, the bird holds a forward leaning pose, with neck extended.
4. Feeds on fish, insets, shrimp, and crabs.
5. Flies with neck pulled in.

Snowy Egret

1. Nearly one half the size of the GREAT EGRET.
2. Slender black bill, black legs, and yellow feet.
3. Eats crabs, insects, and fish.
4. Flies with neck pulled in.

White Ibis

1. Nearly one half the size of the GREAT BLUE HERON.
2. White with black-tipped wings on the underside.
3. The immature are dark brown.
4. Has long curved orange bill with red on face.
5. Digs through mud and sand with bill for crabs, insects, and worms.
6. Groups fly in "V" formation with necks extended.

Brown Pelican

1. Brown in color, wing spread six and one half feet.
2. Long flat bill and great throat pouch.
3. Flies in line formation, head back on shoulder with long bill resting on breast. (They take turns as leader.)
4. Crash dive when going after food.
5. Main food is fish

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

Least Tern

1. Small (slightly smaller than a Blue Jay)
2. Pale gray with yellow bill and feet with a white forehead.
3. Flies with rapid wing beats.
4. Stops in mid flight looking for fish and then dives head first to catch them.
5. Has a quick screech when flying.

Osprey (Fish Hawk)

1. Large hawk-like: brown, white chest and head resembling a BALD EAGLE.
2. Black mask going through eyes and down the back of the neck.
3. Hovers on beating wings looking for fish and plunges feet first to catch them.
4. Fish are grabbed by their huge talons (claws.)
5. Often seen sitting in dead branches of trees.
6. Known for their loud screech.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

WHAT ELSE MIGHT YOU SEE IN THE HAMMOCK?

Golden Orb Weaver Spider
Big female in rounded web. Male is tiny and skitters around the web waiting for tiny insects. When she is young she builds a beautiful, very photogenic web. As she ages, however, she seems to lose interest in housekeeping and only half-heartedly builds an unfinished web.

Spinybacked Orb Weaver Spider
Also an orb weaver whose colorful sharply spined shell resembles a crab. The spikes probably deter predators like lizards and birds. The male and female of this species are similar. Both of these species of spider are not poisonous, but will bite if harassed.

Zebra Longwing Butterfly
Big, yellow and black striped; the stripes break up the outline so predators have a hard time seeing it. It lives for about 6 months, which is very long for a butterfly.

Gulf Fritillary Butterfly
Brilliant red orange above silvery white teardrop patterns underneath (when in flight, the underside flashes white)

Giant Swallowtail Butterfly
America's largest butterfly. Gold spots forming a cross pattern on a black background, with distinctive orange spot on each hind wing close to rear abdomen. Larva, the "orange dog" feeds on Wild Lime and other citrus.

Sulfur and White Butterflies
There are several genera of these butterflies, but we don't know yet what species are here in the Park. They are often found feeding on Spanish Needles.

Day Flying Moth
Composia- midnight blue and white with a flash of red.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

THE BEACH DUNE

The beach environment in contrast to the hammock is rigorous-hot, dry, windy, and salty. Plants and animals that live there must adapt. In order to retain moisture the leaves frequently have leathery and waxy surfaces like the seagrape or are hairy or prickly to help keep off the salt.

The face of the beach is ever-changing. A barrier island such as Singer Island, Palm Beach, Hutchinson Island, Jupiter Island etc. protects the mainland by absorbing and deflecting wave energy. The shape of the island is always changing. In summer calm seas bring sand in and deposit it on the beach giving us a wide flat beach perfect for summer swimming. Winter storms scour sand from the beach and deposit it offshore, sometimes causing disastrous erosion of the protective dunes. –(Point out evidence) Sea level is rising, maybe as much as 1ft. / 100 years. That doesn't sound serious until you realize that a 1ft. Rise in water could mean 1,000 ft, shoreline retreat!

ON THE BEACH AT THE SHORELINE

To-Do: (throw, or ask a member of your group to do it, a heavy floating object into the water past the surf line a coconut is perfect)

The direction of movement indicates the direction of sand transport – this is technically called littoral drift or longshore transport. In this area the net direction of sand transport is Southward.

To-Do: (Wet your palm and place it flat down on some dry sand and examine the sand that adheres to it –have your group do this too).

The sand on this beach is about half quartz / feldspar brought by littoral drift from the rivers of the Appalachians and half calcium carbonate from ground down shells, coral and limestone rock. The light colored and clear sand is quartz, the darker pinkish, brown to almost black sand is calcium carbonate.

AT THE WRACK LINE

This disorganized line of dead, sometimes smelly vegetation is called wrack and not only helps to keep the sand in place but is a valuable food source for the beach inhabitants, such as ghost crabs, birds, and even raccoons wander down at night to browse. For misplaced aesthetic reasons many ill-informed hotels and condominiums scrape the wrack line into piles and bury it forever removing this rich food source from the food web and the seeds that are in it from revegetating the dunes.

Most of the wrack is composed of the brown alga Sargassum, also called Gulfweed, which is found in huge mats in the Sargasso Sea. It floats by means of little round air filled bladders. This assemblage of flotsam and jetsam can keep dedicated beachcombers busy for hours. Please note the enormous amount of non-biodegradable man made trash in the wrack line. Please use your trash bags, don't throw trash on the beach, out of your boat, car, or house ever, for any reason. Our fragile earth can't stand much more of this!!!

ANIMIMALS YOU MAY FIND IN THE WRACK:

Bryozoans
Tiny colonial animals whose skeletons form a honeycomb pattern-that appear white when dry- on the surface of the Sargassum.

Portuguese Man -o- War
Another colonial animal usually found in the winter. Its very long tentacles can inflict a painful sting and when present in great numbers can make swimming dangerous. If you are stung do not rinse with fresh water and apply meat tenderizer or alcohol immediately.

Janthina
This beautiful purple sea snail hangs around with the man-o-war. She secretes bubbles on which to float and lay her string of about 400 elongate eggs.

By the Wind Sailor- Velella
Another purple jelly fish that floats on the ocean's surface and catches the wind with the large triangular vertical "sail".

Spirula (a rare find)
This fragile, flattened spiral comes from inside a deep-water squid. When it dies and decomposes the shell floats to the surface and sometimes onto our beaches.

Drift Seeds
Many of these seeds have floated on ocean currents from as far away as Africa and the Amazon and Orninoco rivers of South America.

Sand Fleas
The shorebirds frantically pecking at the sand and running from the waves are looking for succulent sand fleas, little crustaceans that live and feed just at the surf line. Birds love them as do fish and fisherman-as bait. Most of the sand fleas are female and often bright orange broods of eggs nestled under her abdominal plate. The males are very small and not very common.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

BIRDS ON THE BEACH

Most of the birds are winter visitors. Identification of shore birds can be a challenging task. To the uninitiated, they all look alike, but it is fun to try, so get a good field guide, a pair of binoculars and go for it.

Three common shorebirds that are fairly easy to identify:

Sanderling
About 6.5” in length and feeds in flocks along the waters edge. Reddish in spring, light gray in winter, black legs.

Ruddy Turnstone
About 7” in length, slender pointed, bill slightly turned up at tip, distinctive black pattern on head and breast and short orange legs. In flight striking black, brown and white pattern on wings, rump and tail.

Black-bellied Plover
About 8” in length. Winter plumage is all gray with black armpits visible in flight.

The two most common species of gull are the Ring Billed and Herring Gulls.

Terns are seen on the beach and fishing just offshore.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

SEA TURTLES

Five species of sea turtle are found in Florida's waters – Kemp's Ridley, Hawksbill, Green, Loggerhead and leatherback. Although the last three nest on this beach, the loggerhead is by far the most common.

Loggerhead

The female Loggerhead mates only once every two to three years but may nest several times in one season, laying at night up to 130 eggs each time. If her nest remains unmolested by crabs, raccoons, and people hatchlings emerge at night after 60 days only to be grabbed by waiting crabs, birds and raccoons. The few lucky ones that make it to the waters edge swim right into the mouths of hungry fish. No more than one percent of the hatchlings survive to maturity.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

BEACH DUNE VEGETATION

The best natural defense against beach erosion is stable dune vegetation. The sea oats, protected by State and Federal Law, not only stabilize the dunes but make it grow. Deep roots anchor the sand and high tufts of leaves capture sand suspended in the wind. When the sand eventually piles up and covers the plant a new tuft grows building the dune higher.

Railroad Vine

One of the first plants to colonize the beach after a storm, this pioneer plant helps to stabilize the sand so other plants such as the Sea Oat can grow. Attractive, leathery leaves are about 4" long and broad with two lobes-hence the Latin name "goats foot". Beautiful lavender morning glory flowers bloom throughout the year.

Bay Bean

Vining over the beach and climbing adjacent trees, the sweet pea flowers, long bean pods and large, shiny, tri foliate leaves add beauty and color to the beach habitat. Because it grows fast, the Bay Bean is often used in beach revegetation projects.

Spanish Bayonet

This classic desert plant, with 30 species occurring in the Western Hemisphere, grows on sand dunes and stiff pointed leaves radiate around a tall crown of creamy white flowers.

Spider Lily

A clump of beautiful, delicate, white flowers borne at the end of a stalk rising from the center of a rosette of evergreen, leathery, straplike, leaves –another spectacular beach plant.

HEALING BLOW OUT AREA

When dunes are breached by storms or by human interference such as this one was, the unprotected sand blows away and blow out areas occur. However, when left to her own devices Mother Nature will heal itself.

Each time you return I hope you will look deeply and see new things with a global understanding. We are all interdependent and our actions as human beings always have an influence on our natural world either directly or indirectly. This earth is our only home and we are its stewards. Take care of it.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

THE MARVELOUS MANGROVES

Mangroves grow along the shore of the lagoon and provide valuable habitat for many animals.

Birds nest in the branches or use the trees as a roost to rest.

Mangrove leaves are tough. Not many animals will eat them while the leaves are still on the tree.

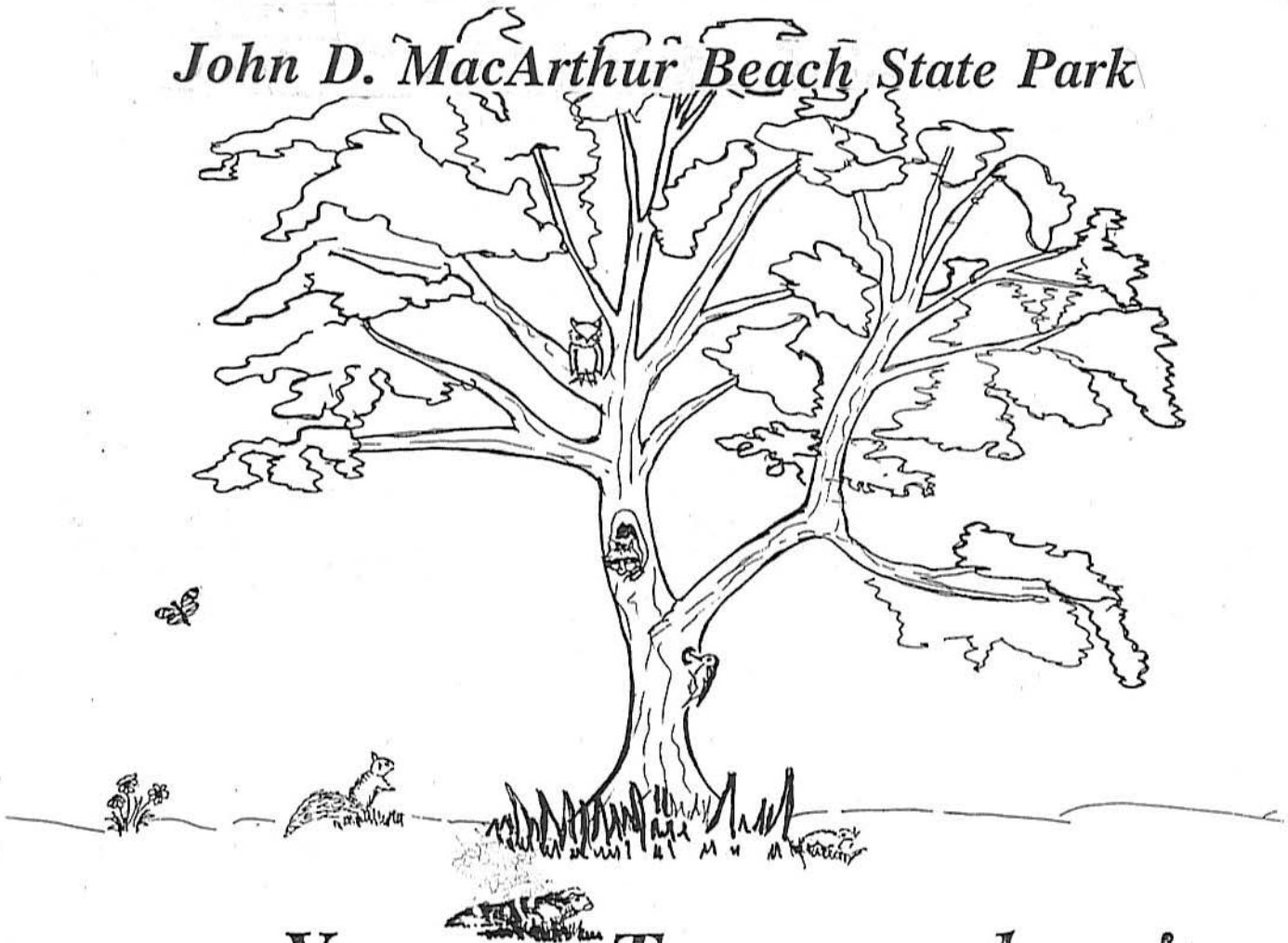
After the leaves fall into the water they start to decay. Decaying mangrove leaves are an important food source for small critters in the lagoon.
The prop roots of the red mangrove provide a nursery area to young fish, a place where they can find shelter from larger fish and find food as well. The prop roots also provide a place for oysters and barnacles to attach.

A MANGROVE TREE IS A VERY BUSY PLACE!

Information adapted from St. John's Water Management District.

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

John D. MacArthur Beach State Park



You are Tree-mendous!

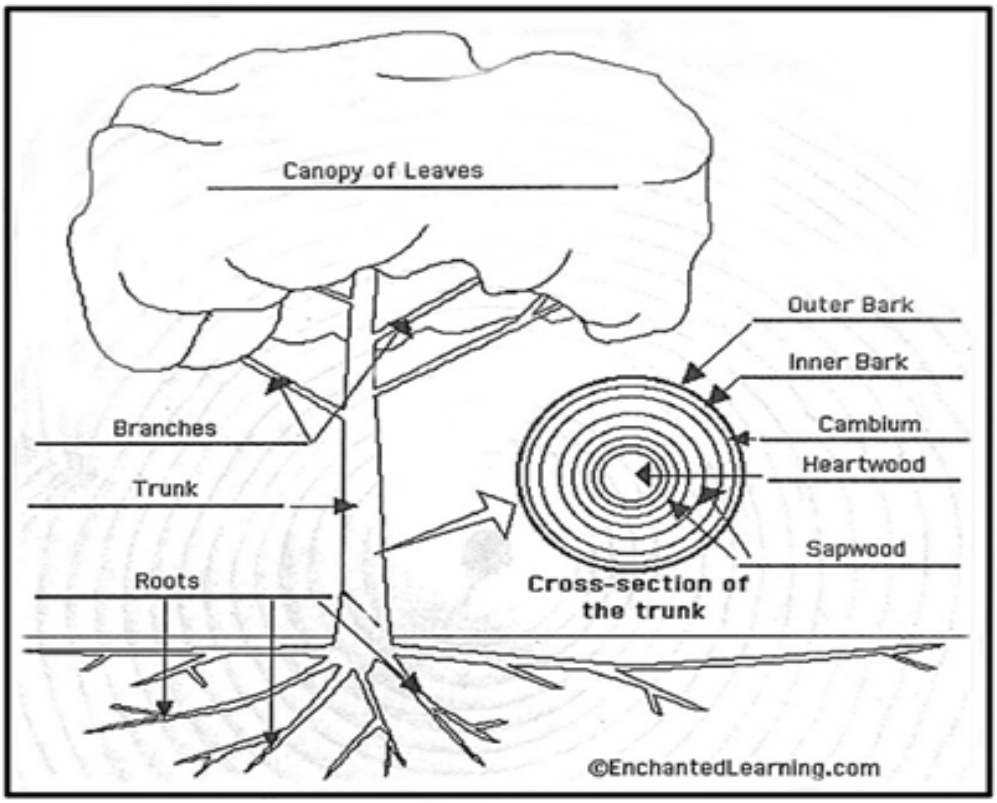
Name: _____

VOCABULARY

Anastasia Formation	Limestone rock made up of sand and shell.
Aquatic	Growing in or usually living in water.
Archaeologist	A person who studies the culture of ancient people by looking for remains and artifacts.
Barrier Island	Coastal islands that protect the mainland from waves and wind.
Bio-diversity	The variety and variability of plants, animals, microorganisms and the habitat they comprise.
Biotic	Living things in the environment (animals, plants, etc.)
Canopy	The top layer of leaves and branches in the canopy
Carnivore	An animals that eats only other animals.
Climate	Weather over a long period of time.
Consumer	An organism that eats any other living thing.
Decomposer	An organism (bacteria or fungus) that breaks down dead plant and animal material.
Detritivore	An animal that eats detritus. (Example: earthworm)
Detritus	Rotting plant and animal material.
Dune	A ridge of windblown sand covered with low vegetation that protects inland areas from ocean waves and winds.

Estuary	Protected habitat where fresh and salt water mix. It is a safe place for many young marine animals can grow.
Exotic	A plant or animal that does not naturally belong in an area, alien.
Food Chain	The path by which energy passes from one living thing to another.
Food Web	Overlapping food chains.
Gulfstream	A warm ocean current that flows from the south along the east Coast of North America.
Habitat	A place where there is enough food, water and shelter for a plant or animal to live and grow.
Herbivore	An animal that eats only plants.
Jeaga (YEA-ga)	A Native American tribe that lived on the Southeast coast of Florida
Omnivore	An animal that eats both plants and other animals.
Peninsula	Land that has water on three sides of it.
Producer	An organism that produces its own food. (Example: A plant, which produces its own food through photosynthesis.)
Rock Reef	Outcropping of Anastasia limestone in the water near the beach in which fish, snails, crabs and other marine animals and plants live.

PARTS OF A TREE



Bark
Protects the tree from disease, fire damage and injury

Branches
Woody parts of the tree that grow from the trunk

Cambium
One of the growing layers. Makes the trunk, branches, and roots grow thicker.

Canope of Leaves
The upper parts of the tree, where the branches and leaves are located

Heartwood
The core of the trunk, which contains very strong, dead tissue that supports the tree

Phloem (FLOW-um)
Acts as a food supply line from the leaves to the rest of the tree.

Sapwood (xylem)
A pipeline carrying water and minerals up the tree from the root to the leaves and other parts of the tree.

Trunk
The main support of the tree

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

POST TRIP ACTIVITIES

Read ***The Giving Tree*** by Shel Silverstein

Adopt a tree on the school grounds to be a class friend.

To learn more about your new class friend:

- Students can observe their tree using four of five senses –
  LOOK at leaf veins with a magnifying glass.
  SMELL the leaf or twig.
  LISTEN to the rustling leaves
  FEEL the texture of the bark & leaves
- Measure the distance around the trunk with yarn or a tape measure. Estimate the height
- Make a class leaf rubbing booklet
- Find out the name and a few facts about their tree

Story Starter: “If my tree could talk, I would ask it….”

Write a class letter to the Park

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703 • North Palm Beach, FL. 33408
(561) 624-6952 or (561) 624-6950 • Arthur.Carton@dep.state.fl.us

CONTACT INFORMATION & DIRECTIONS

John D. MacArthur Beach State Park and Nature Center
10900 State Rd. 703
North Palm Beach, FL. 33408
(561) 624-6952
(561) 624-6950

Program Coordinator:

Arthur R. Carton
Park Services Specialist
(561) 624-6970
Arthur.Carton@dep.state.fl.us

DIRECTIONS:

From the NORTH or SOUTH
Take I95 to PGA Boulevard (SR-786 E exit- exit number 79AB)
Exit to PGA Boulevard EAST - 3.03 miles
PGA Boulevard crosses US#1 and becomes State Road 703
Continue EAST 2.07 miles to PARK ENTRANCE on left.