

Tracking Bears



Key question

Where do Florida black bears go during a year?

Conceptual frameworks topics

- IV.B. Florida black bear behavior
- IV.C. Florida black bear seasonal activities
- V.A. Habitats used by Florida black bears
- VII.B. Other organisms found in Florida black bear habitats

Subjects

Mathematics, Social Studies, Science, Language Arts

Time estimates

60-90 minutes per day for one to two days

Key vocabulary

Home range, habitat mosaic

Supplemental video clips

[Time 10:22-12:04 from 60-minute video](#)

[Time 5:14-6:27 from 15-minute video](#)

Objectives

As part of this activity, students will:

1. Plot the monthly movements of male and female Florida black bears on a map.
2. Compare and contrast the seasonal movements and activities of male and female Florida black bears.
3. Calculate the total distance traveled by male and female Florida black bears during a year.
4. Describe the seasonal habitat requirements of male and female Florida black bears.
5. Explain why Florida black bear home ranges contain a mosaic of habitats.

Materials

Essential:

Per pair of students:

- One set of male and female “Tracking Bears” [Habitat Maps](#)
- One set of male and female “Tracking Bears” [Clue Sheets](#)
- One straight-edged ruler
- One set of colored pencils



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- One “Tracking Bears” [Worksheet](#)

Supplemental:

Per pair of students:

- One calculator

Per class:

- Digital display of male and female “Tracking Bears” Habitat Maps
- Replica of black bear tracks or track molds

Background

Florida black bears use a wide variety of forested habitats to meet their basic needs. The forested habitats used most often by Florida black bears include pine flatwoods, hardwood swamps, cypress swamps, cabbage palm forests, sand pine scrub, and mixed hardwood hammocks. The two basic needs which seem to have the greatest influence on a Florida black bear’s choice of habitat are: 1. the type and amount of food available and 2. the quality of cover available, especially for winter denning. As indicated in Lesson 5, Florida black bears consume a wide variety of different types of food, including nuts, berries, insects, small animals, and plant parts such as roots and leaves. Because adequate amounts of these major food types are not available in any one forested habitat throughout the year, Florida black bears travel to different habitats as different types of seasonal foods become available. In addition, although some of the forested habitats used by Florida black bears are relatively sparse and open, during the winter denning season black bears usually seek out remote areas of habitat

like swamps containing dense, thick stands of trees or vine-covered, shrubby thickets.

The combination of different habitats, plant communities, or forest types that wide-ranging species like the Florida black bear need to survive is called a **habitat mosaic**. Because the type and relative abundance of different forest types varies in different parts of the state, bears living in different parts of Florida depend on different combinations of habitat mosaics for their survival. For example, black bears living in the Osceola National Forest in northeast Florida depend primarily on forested swamps and cypress swamps and spend little time in drier forested habitats such as pine flatwoods. On the other hand, black bears living in the Ocala area in central Florida spend much more of their time in drier habitats such as pine flatwoods and sand pine scrub.

Regardless of the types of forested habitats used by bears, all black bears in Florida follow the same seasonal pattern of food preferences and activity levels. During the winter, if food is scarce, both male and female black bears may spend time denning. During this period, they eat very little and do not travel very far. When they emerge from their dens in early spring, Florida black bears become more active and wide-ranging, feeding primarily on young, tender, green plant leaves and shoots, and hearts of cabbage palm and saw palmetto. In the summer, they range more widely looking for foods



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such as insects and soft fruits from plants like swamp tupelo, blackberry, blueberry, and gallberry. In the fall, as leaves and soft fruits become scarce, both male and female black bears can travel great distances throughout their habitats in search of foods such as saw palmetto buds and berries, and acorns.

The area of habitat regularly used by Florida black bear during the year is called its **home range**. Although many of the seasonal activities and feeding preferences of male and female Florida black bears are similar, the home ranges of male black bears are significantly larger than the home ranges of female black bears. Generally, male black bear home ranges are four to 10 times larger than female black bear home ranges. Depending on the quality of available habitat, home ranges for adult male black bears in Florida can be as small as 36 square miles to as large as 135 square miles, while home ranges for adult female black bears can be as small as 9 square miles and as large as 34 square miles. In general, bears living in higher quality habitats with a greater abundance of food sources have smaller home ranges than bears living in poorer quality habitats with a lower abundance of food sources. Like many other large, non-migrating animals, both male and female black bears will defend food sources in their home ranges from other bears. Male black bears are generally more aggressive than females and it appears that they mark their home range boundaries to alert other bears. In a given habitat, the

strongest males establish their home ranges in areas with the best food availability, while older, sicker, weaker, or younger males end up establishing home ranges in more marginal habitat. Usually, male Florida black bear ranges overlap with the home ranges of three or more female black bears. Each female black bear establishes a smaller home range which is sometimes within the larger home range of a male bear. Generally, female black bears with cubs are dominant over females without cubs. Thus, females with cubs claim the higher quality habitats while older, sicker, weaker, or younger females occupy the more marginal habitats. However, all female black bears are subordinate to healthy, strong, adult male black bears. The distances traveled, types of habitat used each month, and monthly activities described in this lesson are all based on actual research data of the seasonal movements of male and female Florida black bears. However, the plotting map used for this activity is just a simplistic representation of a hypothetical Florida black bear habitat and the monthly movements plotted just illustrate a possible movement pattern. In addition, Florida black bears rarely travel in an actual straight line. Instead, their daily movements during a month usually involve traversing an area several times and exploring specific areas looking for food, denning sites, etc.



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Although students conducting this activity will plot movements using straight lines, actual daily movements are much more zigzagged.

Apparent monthly movement:



Actual monthly movement:



As a result, although the apparent distance traveled from the beginning of one month to the beginning of another month might be six miles, the actual monthly distance traveled as part of a bear's daily wandering movements might be 30 or 35 miles.

It is important to note that in order to help students develop an understanding for certain bear behaviors and activities, the monthly activity descriptions on the Clue Sheets contain some anthropomorphic statements. While no one can be sure what a bear is thinking when he or she displays a particular behavior, these descriptions are designed to help students get a glimpse of life from a Florida black bear's perspective.

Advance preparation

Prepare student copies of the "Tracking Bears" Habitat Maps, male and female Clue Sheets, and Worksheet. If possible,

prepare to display the male and female Habitat Maps as well.

Procedure and discussion questions

1. Introduce the lesson by asking students to describe where they go and what they do during weekdays and on weekends. Next, ask students to think about how far they usually travel away from home on an average day. Use their responses to introduce the term **home range** as the area of habitat regularly used by an animal during a year. Explain that home ranges for large animals, like people or bears, are usually measured in square miles. Ask students to speculate about the sizes of their personal home ranges in square miles.
2. If possible, pass around a Florida black bear track replica for students to examine. Have students compare the size of a black bear paw with the size of their own hands and feet. Point out bears walk on all five toes, and that their hind feet look different than their front feet, both characteristics they share with people.
3. Next ask students if they think Florida black bears have ranges that are larger, smaller, or about the same size as their own home ranges. Then ask students if they



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think the home ranges of male and female black bears are the same size.

4. Ask students if they have ever seen a treasure map before. If necessary, draw a sample “treasure map” on the board and show students how to use symbols representing key landmarks and an orientation compass indicating direction to plot movements on a map. Explain that during this lesson students will be working in pairs to read a set of clues and create a map which shows where male and female Florida black bears go during a year.
5. Divide students into pairs. Ideally, if the number of male and female students in your class is about equal, each pair should consist of one male student and one female student. Distribute one set of male and female “Tracking Bears” Habitat Maps, one set of male and female “Tracking Bears” Clue Sheets, a straight-edged ruler, and a set of colored pencils to each pair.
6. Assign one student in each pair to represent the female bear. Explain that in each pair, the male and female bears should each use four different colored pencils for the mapping activity. Each colored pencil will represent a different season. Have students record the colors they chose to use for each season in the spaces provided on the Habitat Maps. For purposes of later comparison, you may want to have all groups use the same colors for seasons on their graphs, (e.g., SUMMER=green, FALL=orange, WINTER=red, SPRING=blue).
7. Explain that in each pair, students should start with the month of June and take turns reading, aloud to their partners, the clue for each month on their Clue Sheets. After reading a clue aloud, students should then use a ruler and the compass on their “Tracking Bears” Habitat Maps to figure out where their bear traveled that month. Students should then plot their bear’s movements on the map using their colored pencils. Above each line drawn, instruct students to write down the name of the month plotted and the number of miles traveled that month. **For younger students or students who are not familiar with treasure map activities, use displays of the male and female Habitat Maps to demonstrate the process of plotting.** You may have to work through one entire season of clues as a class to make sure students understand what they are supposed to do.



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8. Students should continue plotting their assigned bear's movements each month and connect the lines for each month's movement together to form a path. When they are done, their maps should contain diagrams showing the different paths and distances traveled by an adult female black bear and an adult male black bear during one year.
 - the year? (Yes) Why? (Because different types of food are available during different seasons of the year.)
 - During which seasons did your bears spend most of their time in the pine flatwoods? (Summer)
 - Which type of habitat was used the least by your bears? (Scrub)
 - In which type of habitat did your bears spend most of their time? (Swamp)
 - During which season do Florida black bears travel the farthest? (Fall)
 - During which season do Florida black bears travel the least? (Winter)
 - Why do you think Florida black bears travel so much farther during the fall? (Food is becoming scarce so they have to travel farther to find enough food. Bears also need more food in the fall to fatten up before winter. Bears are also searching for denning sites in the fall.)
 - Which kind of Florida black bear, male or female, travels farther during a year? (Male)
 - Which kind of Florida black bear, male or female,
9. Circulate and assist students as they work on their maps. Once the maps are completed, distribute a "Tracking Bears" Worksheet to each pair and pass out calculators if they are available. Ask student pairs to work together to answer the questions on the Worksheet.
10. Once Worksheets are completed, have students share their responses to each item on the Worksheet. Use pertinent background information and student Worksheet data to conduct a whole-class discussion addressing questions such as the following:
 - During which season do Florida black bears mate? (Summer)
 - During which season do Florida black bears have their cubs? (Winter)
 - Do Florida black bears eat different types of food during different seasons of



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- spends more time denning?
(Female)
- Why do you think female Florida black bears spend so much more time denning in the winter? (It is safer in their den while they are nursing their cubs.)
 - Why don't Florida black bears just stay in one kind of habitat throughout the year? (They need to move to different habitats throughout the year as different kinds of food become available. In addition, some of the habitats they depend on for food do not provide enough dense cover for winter denning.)
 - What could happen to your black bears if the scrub habitat in their home ranges was developed into a neighborhood? (They could start foraging in the neighborhood instead of in natural habitat.)
 - Which kind of Florida black bear, male or female, has a larger home range? (Male)
 - About how many adult female Florida black bear home ranges from this activity could fit into the home range of the adult male Florida black bear? (Four)
- Does conserving Florida black bear habitat help other species too? (Yes) How? (Since Florida black bears require large habitat areas for their home ranges, conserving habitat for black bears also protects habitat for the hundreds of other plant and animal species living in these same areas of habitat.)
11. Conclude the lesson with a discussion of the term **habitat mosaic** and make sure students realize that, to survive, Florida black bears need access to a mosaic of different plant community types in order to meet their basic needs of food and cover for denning. If time permits, you could also introduce and develop the idea that average home range sizes for Florida black bears vary in different parts of the state. In high quality habitats, like the Ocala area, where a wide variety of food sources are available, home ranges are significantly smaller than they are in lower quality habitats, like the Eglin Air Force Base, where food sources are less abundant. As a result, bears living in poorer quality habitats have to travel much farther in order to find enough food to survive and thus risk crossing roads and being struck by cars. Conserving large tracts of habitat helps minimize



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bears being killed by vehicles in these areas.

Modifications for younger or ESE/ESOL students

1. Instead of having individual students read their own monthly clues, read each clue aloud to the entire class and have student pairs plot each month's bear movements on their maps. Work through the male bear map first with the entire class and then work through the female bear map.
2. Have students respond to the items on the Worksheet orally and record key Worksheet information on the board for the entire class instead of having each pair complete its own Worksheet.
3. If many of your students have difficulty with calculations, provide the information requested on items 4, 5, and 6 of the Worksheet rather than having the students compute the values themselves.

Assessment suggestions

1. Collect completed Habitat Maps to determine if students accurately plotted the monthly seasonal movements of male and female Florida black bears.
2. Collect completed Worksheets to determine if students were able to

compare and contrast the seasonal movements and activities of male and female Florida black bears.

3. Collect completed Worksheets to determine if students correctly calculated the total distance traveled by male and female Florida black bears during a year.
4. Collect completed Worksheets to determine if students accurately identified the seasonal habitat requirements of male and female Florida black bears.
5. Provide a writing prompt such as the following: "Florida black bears need different types of habitats just like an artist needs different colors of paint to complete a picture." Have students write a short paragraph explaining why Florida black bears depend on a mosaic of habitat types for their survival.

Art Extension

Use track replicas of black bear front and rear paws to make artificial tracks in an area of soft, moist soil in your schoolyard. Then have students make their own plaster casts of black bear tracks. To complete the track making activity indoors, have students use plaster of Paris to make a cast of a black bear track from a track mold.



Tracking Bears Clue Sheet: ADULT MALE BEAR

Summer Season

June – You start the month in a dense thicket of saw palmetto on the east side of your home range where the pine flatwoods connects to the cypress swamp. You smell the scent of an adult female in the area and spend three days with her. After you mate, you begin moving toward the saw palmetto thickets in the northwest corner of your home range, eating berries and other fruits along the way. **You travel 37 MILES in June.**

July – You start the month in the northwest corner of your home range and move along the north edge of your home range eating berries and other plant parts and marking “bear trees” all along the way. When marking trees in your home range, you rub your back along the tree trunks, bite the tree, and use your claws to scrape large pieces of bark off the trees. You hope these signs will let other bears know where your home range is. Once you reach the northeast corner of your home range, you continue heading south through the pine flatwoods until you reach the very large bear tree. **You travel 40 MILES in July.**

August – You start the month at the very large bear tree along the eastern edge of your home range. You head directly west across the pine flatwoods until you reach the western edge of your home range where you catch and eat an armadillo. You then begin heading southeast until you find an open area full of rotten logs. You turn over the logs and enjoy feeding on the bessbugs and other insects living in the logs. **You travel 42 MILES in August.**

Fall Season

September - You start the month in the pine flatwoods near the area full of rotten logs. You head southwest through the pine flatwoods to the bear tree on the other side of your home range. Food in the pine flatwoods is becoming hard to find, so you head southeast and move into the swamp looking for food. You stop at an area full of swamp tupelo trees and feed on their berries. **You travel 44 MILES in September.**

October - You start the month in the tupelo tree swamp and then wander northeast looking for food. You move into the scrub habitat and spend several days there feeding on acorns from oak trees. You then move to the southeast corner of your home range until you reach an area of high dry land full of saw palmetto. This area looks like it might be a good site for a winter den. **You travel 44 MILES in October.**

November - You start the month at the area of high dry land in the southeast corner of your home range but you decide to keep looking for a better den site and more food. You head west from this site and stop to feed on yellow jacket larvae living in an underground nest. **You travel 33 MILES in November.**



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Winter Season

December - You start the month at the underground nest of yellow jackets. Temperatures are getting cooler and many plants are losing their leaves. You continue heading west to the edge of your home range where you find a large cypress tree that is almost 200 years old. You then head northeast through a swamp looking for more food to eat and a good denning site. You stop in a dense area of swamp full of a thick tangle of vines. **You travel 33 MILES in December.**

January - You start the month in the dense swamp full of vines. You decide this will be a good denning site. You climb onto a mound of dry land surrounded by vines and make a den in the thick vegetation by shredding saw palmetto fronds. However, you are disturbed by campers in the area and begin moving southeast. You decide to make a den in the area of high dry land you found in October. **You travel 33 MILES in January.**

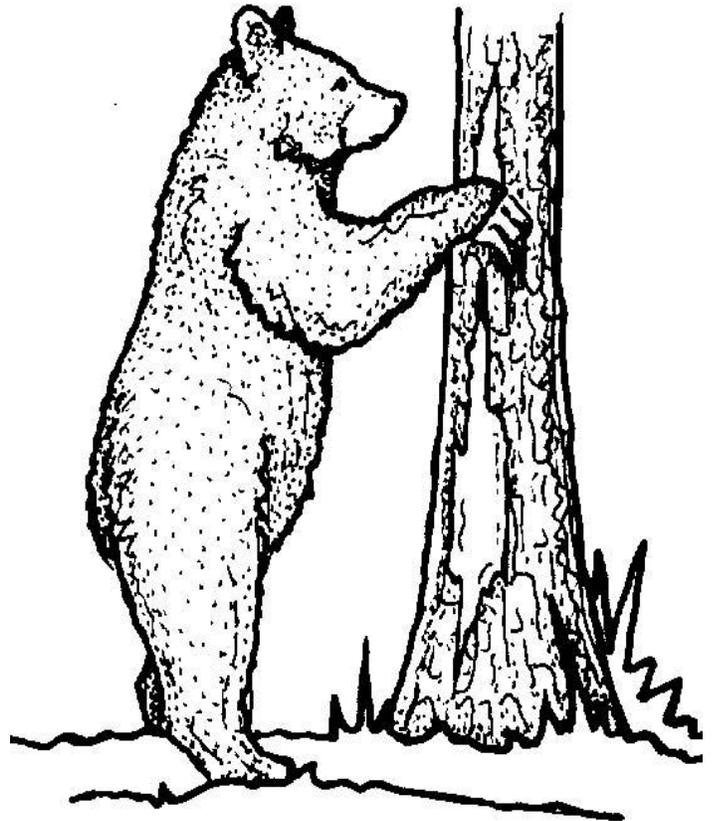
February - You start the month in your den on the high dry land in the southeast corner of your home range. You are not disturbed in this area and spend most of your time sleeping. Occasionally, you leave your den to look for food nearby. **You travel 0 MILES in February.**

Spring Season

March - You start the month at the same den site. Temperatures are starting to get warmer and you are getting hungry again. You leave your den and begin heading northwest. You stop to feed on the new leaves of alligator flag plants growing in the swamp. **You travel 17 MILES in March.**

April - You start the month in the swamp with alligator flag plants. You continue feeding on new spring leaves growing on plants in the swamp and continue heading northwest until you reach a forest full of cabbage palm trees. **You travel 37 MILES in April.**

May - You start the month in the stand of cabbage palm trees. Cabbage palm hearts are one of your favorite foods, so you climb the trees and tear apart the trees to feed on the soft, tender hearts. You then head northeast back to the saw palmetto thicket you visited during June last year. **You travel 33 MILES in May.**



Tracking Bears Clue Sheet: ADULT FEMALE BEAR

Summer Season

June – You start the month in a dense thicket of saw palmetto in the center of your home range where the pine flatwoods connects to a cypress swamp. You feed on the saw palmetto berries and urinate, which attracts a male bear. You spend three days with a large adult male and after you mate you head directly west through the pine flatwoods until you come to a dead slash pine tree that has been struck by lightning. **You travel 13 MILES in June.**

July – You start the month at the dead slash pine tree on the western edge of your home range. You continue heading north along the western edge of your home range. You continue feeding on berries and other food in the flatwoods and stop when you reach a thicket full of ripe blackberries in the northwest corner of your home range. **You travel 19 MILES in July.**

August – You start the month in the thicket of ripe blackberries. You continue moving southeast through the flatwoods, eating berries from gallberry plants along the way. You stop to feed on a colony of termites you find in a dead log. **You travel 21 MILES in August.**

Fall Season

September - You start the month at the colony of termites in the dead log. The days are getting shorter and less food is available for you to eat. You begin moving southwest and stop to feed on ants living in some rotten logs in the pine flatwoods. **You travel 11 MILES in September.**

October - You start the month at the rotten logs in the southern half of the pine flatwoods. You need to find a lot more food before you den for the winter so you move south into the swamp and stop to feed on the berries and leaves of swamp tupelo trees. **You travel 12 MILES in October.**

November - You start the month in the swamp full of swamp tupelo trees. In preparation for your long denning period, you need to fatten up and find a good denning site before your cubs are born in the winter. You head east and check out an area of high dry land for a potential den, but you decide it doesn't seem hidden enough for your cubs. You then head north into the scrub habitat and stop to feed on acorns. **You travel 15 MILES in November.**



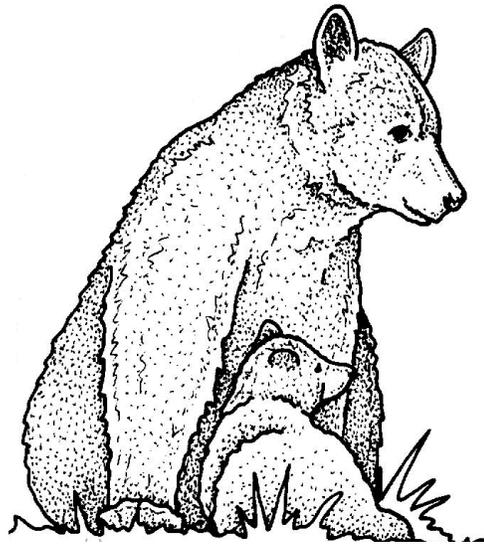
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Winter Season

December - You start the month in the scrub habitat full of acorns. You have gained 100 pounds to carry you through the winter denning period and now you must find a good, safe denning site so you can have your cubs. You head south back through the swamp and find a large, hollow cypress tree stump that will be a perfect denning site for you and your cubs. **You travel 12 MILES in December.**

January - You start the month at the large cypress tree stump which will be your winter den. Since you are pregnant, you begin denning in early January, much sooner than male black bears or other female black bears that are not pregnant. You spend a few weeks lining your den site with tree branches, grass, and leaves to create a warm, safe place for your cubs. Your two cubs are born at the end of January. **You travel 0 MILES in January.**

February - You spend the month in your den in the hollow cypress tree stump. Your cubs were born with their eyes closed and they are helpless and spend most of their time lying on your belly and nursing. You spend most of your time sleeping and resting. **You travel 0 MILES in February.**



Spring Season

March - You are still in the cypress stump den with your cubs. Your cubs are nursing and growing, but both you and your cubs still spend most of your time sleeping in the den. **You travel 0 MILES in March.**

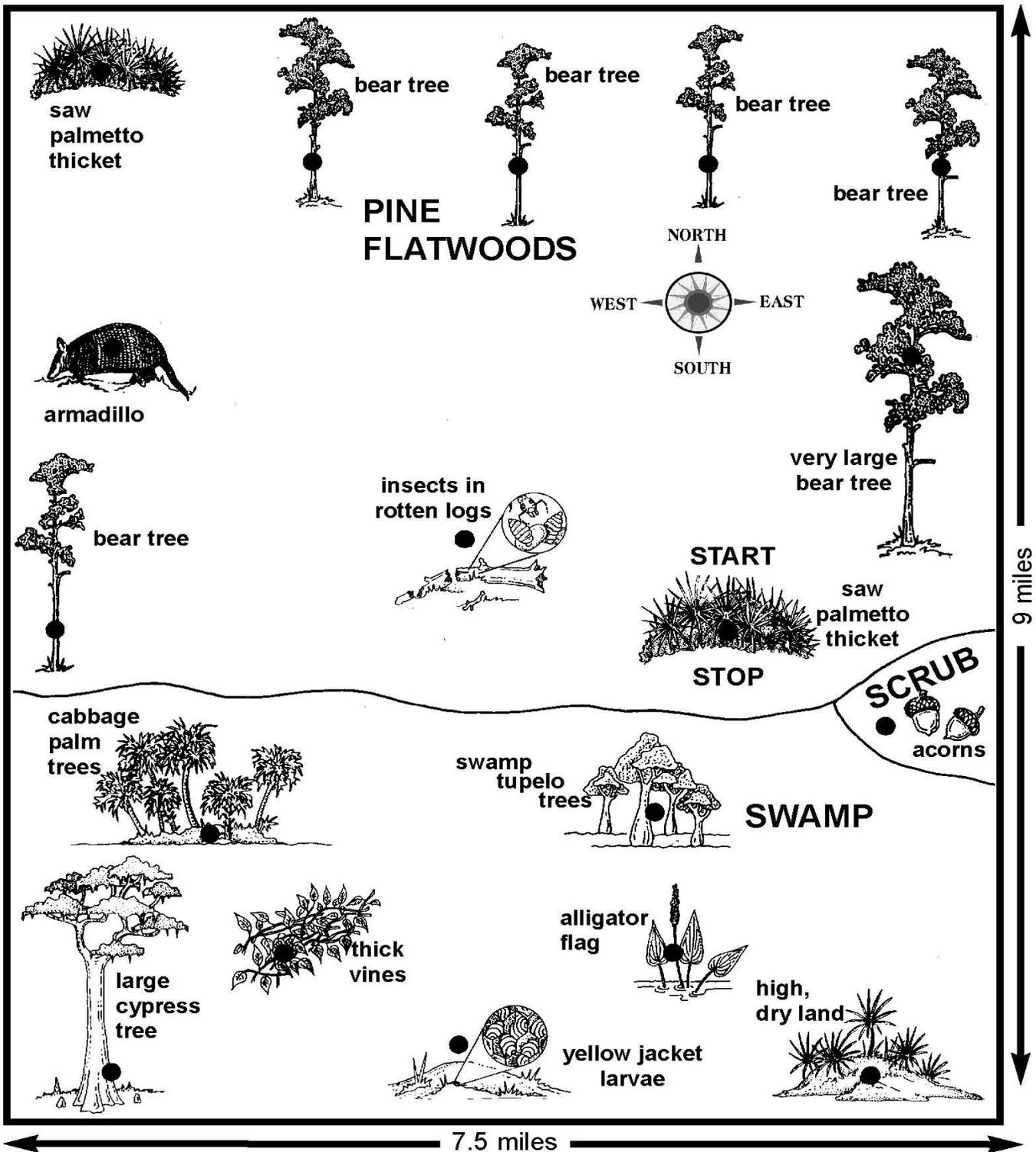
April - You are still in your cypress stump den at the beginning of the month. Temperatures are starting to get warmer and you are getting very hungry after almost three months without eating. Your cubs are now able to move around and are beginning to play and become more active. In the middle of the month, you and your cubs begin venturing out from the den for short periods. You show your cubs what kinds of soft plant parts they can eat and you begin eating too. At the end of the month, you and your cubs stop to eat the new tender leaves of alligator flag plants. **You travel 1 MILE in April.**

May - You start the month at the area of alligator flag plants in the swamp. Although your cubs are still nursing, you continue to show them where to find other kinds of food to eat. You also start teaching your cubs how to hide and escape danger. You and your cubs head north toward the pine flatwoods where you know there will be blackberries, gallberries, and other good foods to eat. Along the way, you stop at a tall cypress tree and show your cubs how to climb up the tree to escape danger. Then you continue north and stop at the saw palmetto thicket along the southern edge of the pine flatwoods. **You travel 8 MILES in May.**



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Tracking Bears Habitat Map - Adult Male Florida Black Bear



Write down the colors you used to plot your bear's movements during each season.

SUMMER _____

WINTER _____

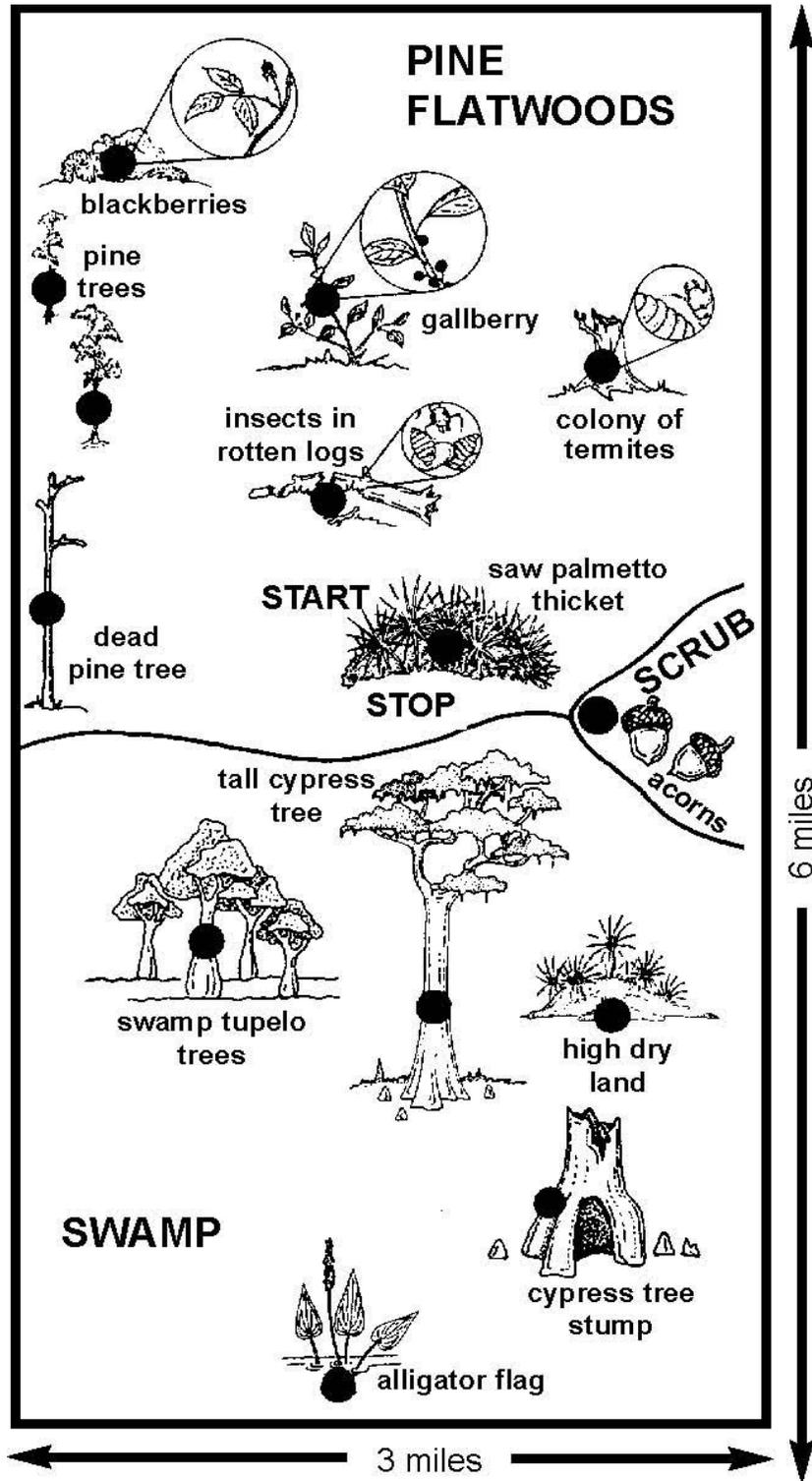
FALL _____

SPRING _____



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Tracking Bears Habitat Map - Adult Female Florida Black Bear



Write down the colors you used to plot your bear's movements during each season.

SUMMER _____

FALL _____

SPRING _____

WINTER _____



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Tracking Bears Worksheet

Name _____

Name _____

Directions: Use your clue sheets and completed maps to answer each question in the spaces provided.

1. A year can be divided into four seasons. Summer, Fall, Winter, and Spring. For each season, write down two activities of female Florida black bears and two activities of male Florida black bears.

SEASONS

SUMMER: June, July, August

FALL: September, October, November

WINTER: December, January, February

SPRING: March, April, May

SEASON	ACTIVITIES	
	MALE FLORIDA BLACK BEAR	FEMALE FLORIDA BLACK BEAR
SUMMER	1. 2.	1. 2.
FALL	1. 2.	1. 2.
WINTER	1. 2.	1. 2.
SPRING	1. 2.	1. 2.

2. For each season, write down two kinds of foods eaten by male black bears and two kinds of food eaten by female black bears.

SEASON	FOOD EATEN	
	MALE FLORIDA BLACK BEAR	FEMALE FLORIDA BLACK BEAR
SUMMER	1. 2.	1. 2.
FALL	1. 2.	1. 2.
WINTER	1. 2.	1. 2.
SPRING	1. 2.	1. 2.



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Tracking Bears Worksheet

3. For each season, write down the habitats used by male and female Florida black bears. The three habitats on your map are: PINE FLATWOODS, SCRUB, and SWAMP.

SEASON	HABITATS USED	
	MALE FLORIDA BLACK BEAR	FEMALE FLORIDA BLACK BEAR
SUMMER		
FALL		
WINTER		
SPRING		

4. Add up the total distance traveled by the male bear and the total distance traveled by the female bear during each season.

SEASON	DISTANCE TRAVELED	
	MALE FLORIDA BLACK BEAR	FEMALE FLORIDA BLACK BEAR
SUMMER	miles	miles
FALL	miles	miles
WINTER	miles	miles
SPRING	miles	miles



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Tracking Bears Worksheet

5. Now, add up the total distance traveled by the male bear and the total distance traveled by the female bear during the entire year.

TOTAL DISTANCE TRAVELED BY THE MALE BEAR _____miles

TOTAL DISTANCE TRAVELED BY THE FEMALE BEAR _____miles

6. Multiply the length of each map by the width of each map to find the area of each bear's home range in square miles.

MALE BEAR

Length _____Miles x Width _____Miles = Area _____Square Miles

FEMALE BEAR

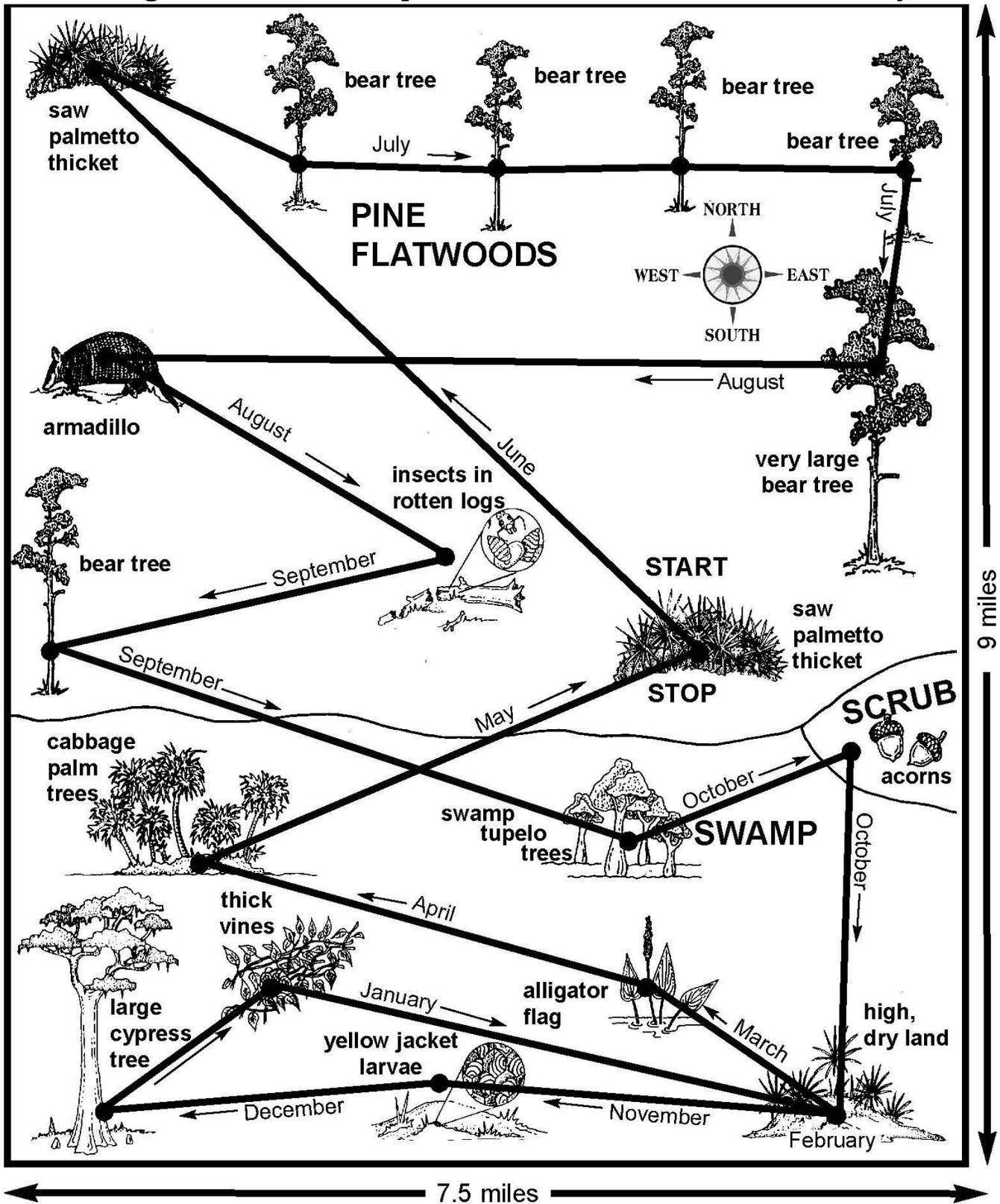
Length _____Miles x Width _____Miles = Area _____Square Miles



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Tracking Bears Habitat Map

Answer Key

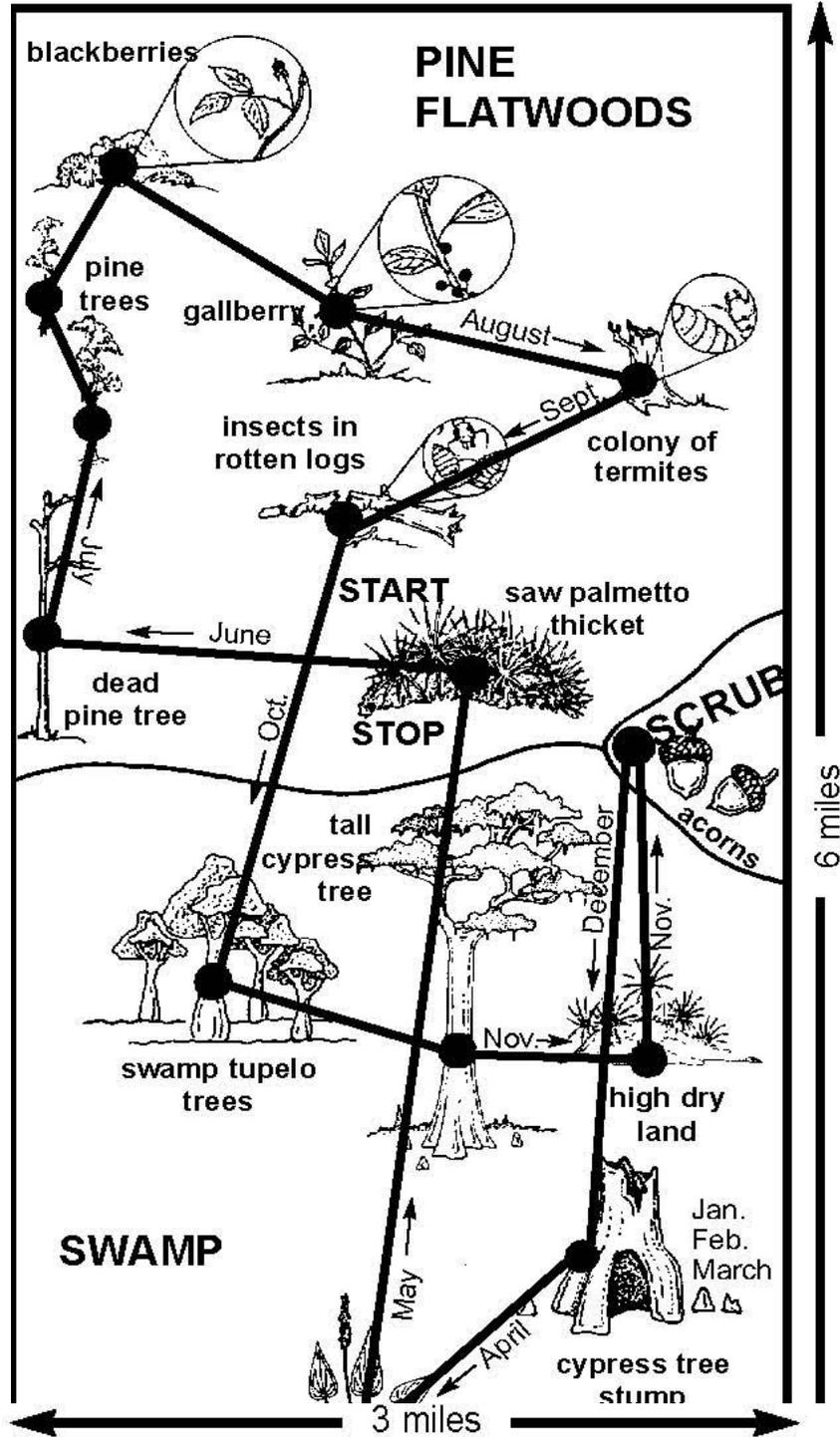


Adult Male Florida Black Bear



Tracking Bears Habitat Map

Answer Key



Adult Female Florida Black Bear

