

# The Florida Black Bear Curriculum Guide

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## INTRODUCTION

Welcome to the fascinating world of the Florida black bear! Chances are, neither you nor your students have ever seen a Florida black bear in the wild. In fact, many Floridians don't realize that bears even live in Florida. Florida black bears once numbered around 12,000 and were found in south Georgia, south Alabama and throughout Florida from the western Panhandle to the Upper Keys. Today, at least 3,000 bears can be found in Florida and occasionally south Georgia and south Alabama. This curriculum is designed to help you and your students explore Florida black bear biology and natural history, investigate the ecological importance of our state's largest land mammal and determine positive and negative ways people can and do influence the Florida black bear's survival.

### **What are the goals of the curriculum?**

As is the case with all effective environmental education curricula, the *Florida Black Bear Curriculum Guide* is designed to help you lead your students from awareness to action. The curriculum's first goal is to make teachers, students, and others aware of the existence of the Florida black bear. The ultimate goal of the curriculum is to stimulate teachers, students, and others to change their personal behaviors and take constructive individual and group actions to help protect and ensure the future survival of the Florida black bear. In order to accomplish this goal, the lessons in this curriculum address four major categories of learning outcomes: content knowledge, attitudes, thinking/problem solving skills, and positive environmental behaviors. The underlying theory supporting an emphasis on these four outcomes is that the more accurate and complete information people have about an environmental topic or issue, the more they tend to care about that issue; the more they care about an issue, the more they want to think about and resolve the issue; and the more they want to resolve and issue, the more likely they are to take responsible action regarding the issue.

### **Why does the curriculum focus on the Florida Black bear?**

The Florida black bear is the largest land mammal found in our state. Focusing on a state level species, provides an opportunity for students, teachers and others exposed to this curriculum to learn about and take positive action to protect the Florida black bear.

Although the primary focus of the curriculum is the Florida black bear, the curriculum actually uses the Florida black bear as a focal point to address many other broad and significant ecological concepts including limiting factors, carrying capacity, optimal versus marginal habitat, habitat fragmentation and habitat corridors, habitat mosaics, and umbrella and indicator species. The underlying message connecting all of the lessons in the curriculum is that the best way to save species like the Florida black bear is to restore, protect and connect large tracts of undisturbed natural habitat. Because children are already naturally interested in, and attracted to, large charismatic mammals



such as bears, the Florida black bear acts as an ambassador and introduces students to broader ecological concepts in a concrete and relevant way.

**What grade levels does the curriculum target?**

In order to instill a sense of environmental stewardship and help adults realize the importance of concepts such as habitat preservation, we must lay the foundation for the future commitment and informed decision-making during the elementary and middle school years. The childhood years are crucial in the development of both a solid, accurate knowledge base and positive attitudes toward wildlife and the environments in which they live. Many of the concepts and issues related to Florida black bears are complex and, at times, abstract. Although younger, primary grade students may be interested in completing some of the activities in this guide, research evidence indicates that many of the biological and ecological principles addressed in this curriculum shouldn't be addressed until students are in the upper elementary grades. In addition, the vast majority of subject area skills used to complete these lessons, especially reading, writing, and mathematics skills, usually aren't taught or reinforced until grades 3 or 4.

Research has also consistently shown that human attitudes toward wildlife and other environmental issues are fixed and very resistant to change by the end of middle school (approximately age 12). Research has also shown that students in upper elementary and middle grades can develop positive attitudes toward wildlife, habitat preservation, and other environmental topics as a result of well designed in-school learning experiences. Although these lessons could easily be adapted and used in high school classes, this guide was designed to target upper elementary and middle school students whose attitudes toward wildlife and other environmental topics are more amenable to change via instruction and exposure.

**Is this a science curriculum?**

Unfortunately, many people equate environmental education with science education. In reality, effective environmental education programs address all major subject areas and good environmental activities are interdisciplinary. Although all of the lessons included in this curriculum guide are based on current and sound scientific research, the lessons in this guide were not designed as pure science lessons. Instead, the lessons were specifically designed to address a wide variety of subject areas in addition to science, including reading, language arts, history, geography, sociology, mathematics, and art. To make it easier to incorporate the lessons from this guide into an existing school curriculum, each lesson has been correlated to both the elementary and middle school Common Core Standards for each subject addressed in each lesson.



### What criteria were used to develop these lessons?

In addition to a commitment to develop lessons for a wider variety of subject areas, six additional objectives guided the development of this curriculum:

- **Objective One:** Develop lessons that really work in elementary and middle school classrooms. To make sure the lessons really work, every one was tried out and evaluated in a variety of real-world classroom settings.
- **Objective Two:** Develop “teacher friendly” lessons, i.e., lessons that are easy for teachers to plan, implement, and assess. Lesson activities and topics were specifically designed to help you address content topics and skills that are already mandated for elementary and middle school programs. Every attempt was also made to design lessons that require minimal teacher preparation time and use inexpensive, easy-to-obtain materials. In addition to familiarizing yourself with the background information provided in each lesson plan, the only real planning required for most lessons involves copying prepared printed lesson materials like game boards, maps, charts, worksheets, or drawings.
- **Objective Three:** Develop lessons that address significant ecological concepts and focus on critical environmental issues related to the Florida black bear. The Conceptual Framework summarizes both the key ideas addressed in this curriculum as well as other important topics you may want to address with your students in addition to those addressed in the 10 lessons provided here.
- **Objective Four:** Develop lessons that students find relevant and interesting. This curriculum was written with children in mind and uses a wide variety of approaches and activities students find motivating, such as board games, role-playing activities, mapping activities, and art activities. In addition, it focuses on animal-related topics young students find inherently fascinating, such as skeletons, maternal behavior, activities of young bears, favorite foods, and interactions with other organisms.
- **Objective Five:** Develop lessons that provide opportunities for students to interact with each other in a variety of instructional settings. In addition to whole-class instruction, which is already commonly used in elementary and middle school classrooms, every lesson in this curriculum allows students to spend at least part of their instructional time in small group, cooperative settings. These interactive small group settings provide opportunities for all students to contribute and share something and they allow students to learn from and teach each other. Some of these experiences involve students working in pairs while others involve larger groups of four to five students. In keeping with the “sink or swim together” philosophy of cooperative learning, many lessons ask students to work together to develop a single joint work product, like a mural or a map. To provide opportunities for individual practice, other lessons encourage students to interact with each other



in groups but require each student to develop his or her own individual work product, like a data table, chart, or graph.

- **Objective Six:** Develop lessons that meet the needs of Florida’s increasingly diverse student population. Students of average and high academic ability should be able to complete all of the components outlined in each lesson plan. However, every lesson also contains suggestions for modifying lessons if you teach classes with a high proportion of lower academic ability, special needs, or limited English proficiency students. In addition, the lessons in this curriculum utilize a wide variety of instructional approaches to meet the needs of students with different dominant learning styles, including:
  1. Discussion and oral presentation activities for verbal learners;
  2. Writing, drawing, mapping, and graphing activities for visual learners; and
  3. Sorting activities, manipulative board games, and active role playing games for kinesthetic learners.

### **How was the curriculum guide developed?**

This curriculum guide was developed over a two-year period and involved extensive input from many different biologists, environmental educators, and elementary and middle school teachers. Original drafts of each lesson were reviewed by several biologists to verify the accuracy and timeliness of the scientific information presented. Each lesson draft was also reviewed by a team of state and regional agency environmental educators to verify the educational appropriateness, relevance, and potential effectiveness of each lesson.

Once this cycle of scientific and educational expert review was completed, each lesson draft was revised based on reviewer feedback. New drafts of each lesson were prepared and each activity was pilot tested in three to six different actual classroom settings.

Fifteen teachers from 12 different elementary schools throughout north, central, and south Florida participated in the pilot testing phase. Based on their own experiences actually trying out these lessons with their own students, the pilot test teachers provided extensive comments and suggestions regarding all aspects of each lesson and identified areas needing revision, elaboration, or elimination. Each lesson was revised once more based on pilot test results and pilot test teacher feedback.

Finally, to document the effectiveness of the entire original 10-lesson curriculum, a formal research study was conducted. As part of this three-week study, four elementary teachers and two middle school teachers from different areas of the state implemented the entire curriculum with their students. Content knowledge and attitude assessments were administered to students before and after implementation of the curriculum. Changes in pre-and post-test scores on these two instruments verified the fact that content knowledge regarding Florida black bears and black bear issues significantly increased and that



attitudes toward Florida black bears and wildlife in general became significantly more positive as a result of exposure to the curriculum.

### **What kinds of instructional approaches are used in the lessons?**

Generally, teachers can approach instruction from one of two major perspectives. They can function as directors who convey information to their students or they can act as facilitators who help their students discover information on their own. The most common techniques used in **direct instruction** are lecture and note taking while the most common techniques used in **facilitative instruction** are discussion and hands on group work. Facilitative instruction takes longer to implement than direct instruction but it results in student learning beyond the level of simple recall or memorization. In facilitative settings, students spend most of their time engaged as active learners who manipulate materials and ideas and engage in higher order thinking and questioning to generate new information on their own. Sometimes, these student-generated ideas are incomplete or partially incorrect, but rather than simply telling students what is “correct,” facilitative teachers use questions to help students refine and correct their ideas.

Numerous research studies have shown that when facilitative instruction is used, students master a greater amount of complex, higher-order material and the information they learn is retained much longer than when direct instruction is used. Ideally, good instruction should consist of a mix of both direct and facilitative instruction. One of the most common and effective techniques for blending these two approaches is a technique called the **Learning Cycle**. All lessons in this curriculum are based on the Learning Cycle model.

### **What is the “Learning Cycle?”**

This model divides instruction into three major phases: exploration, concept introduction, and concept application. In the “Exploration” phase, students brainstorm ideas or engage in discussions or open-ended activities to initially investigate a target concept. The teacher serves mainly as a resource to guide student thinking and encourages students to share their initial ideas. During this phase, teacher often ask questions designed to find out what students already know, or think they know, about a given topic. However, during this phase, teachers do not correct students or let them know whether their ideas are right or wrong. Instead, a facilitative teacher accepts all student input.

During the “Concept Introduction” phase, the teacher takes a more direct, active role and provides student with accurate, relevant information they may not have discovered during the exploration phase. During this phase teachers usually introduce and define key vocabulary and clarify any questions or misconceptions students have about a given topic.

Finally, during the “Concept Application” phase, students work alone or in cooperative groups to practice applying their newly acquired knowledge. During the application phase, students express their understanding of a concept in a variety of ways including answering high-order questions, completing writing exercises, or developing





other work products like charts, posters, or graphs. In this third phase, the teacher once again acts more of a guide rather than a director or source of information.

**Do the Lessons have to be completed in order?**

This curriculum guide is designed to serve as a resource to supplement instruction. As such, it is not prescriptive and with the exception of Lesson 1, which should be conducted first, the other lessons can be implemented in any order or combination depending on the interests and ability levels of your students. In addition, each lesson contains a thorough and comprehensive lesson plan related to the key question of interest. If time permits, you can implement the entire lesson. If time is limited, you can easily simplify or modify the lesson to address the components of greatest relevance to you and your students.

The lessons in this curriculum are arranged in an order which progresses from broad, simple, concrete, and familiar topics to more specific, complex, abstract, and unfamiliar topics. Ideally, to develop a thorough understanding of Florida black bear natural history, ecological importance, and relevant issues facing the species, all 10 of the lessons should be completed. However, each lesson does stand alone and lessons can be completed independently of each other.

**What if I don't know very much about the Florida black bear?**

This curriculum guide was designed specifically for people who are not Florida black bear experts. Every lesson contains a thorough background information section summarizing the most recent research related to Florida black bears. In addition, answers to all discussion questions and student activity sheet items are provided for you as part of each lesson plan. The lessons were all specifically designed to address the most common questions people have about Florida black bears and they directly address the major misconceptions people often have about Florida black bears. Hopefully, implementing the activities in this guide will help you learn as much about the Florida black bear as your students do.

**How do I know if my students actually learn anything from these lessons?**

One of the greatest criticisms educators have about school-based environmental education programs is the fact that many programs simply assume desired learning outcomes occur when lessons are implemented. Many environmental education programs do not include provisions for formally or informally assessing changes in knowledge, attitudes, problem solving skills, or behaviors of students. To address this concern, this curriculum contains specific assessment suggestions for every student learning objective in every lesson. Some of these assessment suggestions are more tangible and formal, such as using a writing prompt to write a paragraph or constructing a chart or graph. Other



assessment suggestions are more informal, such as oral discussion questions or teacher observations of student input during group activities.

This guide was specifically designed to include a wide variety of traditional paper and pencil assessment items like worksheet questions, as well as alternative forms of assessment, such as teacher observations of role playing behaviors, interviews, and cooperative group work products such as maps diagrams or art projects. Pre- and post-test scores on these evaluation instruments can be used to document actual changes in the content knowledge and attitudes of each individual student in your class and they can be used to document the impact of the curriculum on your class as a whole.

### **Going Further**

Obviously, there is no way one small curriculum package can address all of the key concepts and important issues regarding the Florida black bear or any other environmental topic. We hope that exposure to the ideas presented in this curriculum stimulates you to network with educators at other schools, nature centers, zoos, and other settings. We also hope you take advantage of opportunities to network with scientists in your area, such as wildlife biologists and conservation biologists and consult readily-available resources to develop some of your own lessons and activities focusing of Florida black bears and related environmental topics. Together, we hope you and your students take advantage of the many opportunities to “Think Globally and Act Locally.”



## HOW TO USE THIS CURRICULUM GUIDE

This guide contains 10 complete lesson plans and accompanying transparencies, worksheets, game boards, maps, and other needed visual aids and materials. Each lesson plan is organized using the same standard format and includes the following components:

### **Key Questions**

Describes the primary focus of the lesson in question form. The key question(s) can be used to introduce or conclude the activity.

### **Conceptual Frameworks Topics**

Identifies the major ecological/biological concepts addressed in the lesson.

### **Subjects**

Identifies the academic subject areas in which the lesson could be used.

### **Time Estimates**

Estimates the total amount of time needed to complete the lesson in an average elementary or middle school classroom.

### **Key Vocabulary**

Lists key vocabulary terms used in the lesson. All vocabulary terms are indicated in bold type in the text of the lesson plan. These vocabulary terms are also compiled with definitions in the guide's [glossary](#).

### **Supplemental Video Clips**

Lists short video clips from a 15 minute or 60 minute video clip about the Florida black bear that could reinforce ideas in each lesson plan.

### **Objectives**

Describes desired student learning outcomes in the form observable behaviors.

### **Essential Materials**

Lists all materials and supplies needed to complete the lesson and indicates the amount of each material needed.

### **Supplemental Materials**

Lists materials and supplies that could be used to enhance the lesson, if available, and suggests the desirable amount of each supplemental material.



**Background**

Summarizes relevant, current research, and background information related to the lesson's content topic.

**Advance Preparation**

Describes what a teacher needs to do in advance to get ready for the lesson.

**Procedure and Discussion Questions**

Outlines step-by-step instructions for successful completion of the lesson and lists questions that maybe used to guide the discussion portion of the lesson. Acceptable answers to each discussion question are indicated in parenthesis.

**Modifications for Younger or ESE/ESOL students**

Describes suggestions for adapting the lesson to meet the needs of younger (Grade 2 or below) students or students with exceptionalities, special needs, or limited English proficiency. These modifications suggest portions of the lesson that could be eliminated while still allowing students to explore the key questions addressed in the lesson.

**Assessment Suggestions**

Suggests traditional and alternative assessment strategies addressing each of the lesson's student learning objectives.

**Art Extensions**

Where appropriate, this section describes art-related enrichment activities that could be conducted in conjunction with the lesson.

**Correlated Common Core Standards**

Identifies the Grades 3-5 and Grades 6-8 Common Core Standards addressed in the lesson. These standards are summarized for each subject area included in the lesson.



# Conceptual Framework

This framework outlines major scientific concepts and environmental issues related to Florida black bears. Each lesson in this guide addresses one or more of the topics in this outline.

## I. Bears as a distinct animal group

- A. Anatomical features distinguishing bears from other animals
- B. Behaviors/activities distinguishing bears from other animals
- C. Evolutionary history of bears

## II. Diversity of bear species

- A. Names of major bear species and subspecies
- B. Scientific classification of major bear species and subspecies
- C. Characteristics and behaviors common to different bear species and subspecies
- D. Characteristics and behaviors unique to different bear species and subspecies
- E. Geographic distribution of major bear species and subspecies
- F. Habitat distributions of major bear species and subspecies
- G. Status of major bear species and subspecies

## III. Human perceptions/views of bears

- A. The role of bears in human cultures
- B. Categories of human attitudes towards bears

## IV. Florida black bear natural history

- A. Anatomy and physiology of male and female black bears
- B. Behaviors of male and female black bears
  - 1. Feeding behavior
  - 2. Reproductive behavior
  - 3. Defensive behavior
  - 4. Maternal behavior
- C. Seasonal activities and movements of male and female Florida black bears
- D. Life cycles of male and female Florida black bears
  - 1. Stages of Florida black bear life cycles
  - 2. Significant events in each stage of the Florida black bear life cycle
  - 3. Mortality rates in each stage of the Florida black bear life cycle



## V. Florida black bear habitats

- A. Habitats/plant communities used by Florida black bears
- B. General habitat requirements of Florida black bears
  - 1. Food
  - 2. Water
  - 3. Shelter
  - 4. Space
- C. Optimal vs. marginal Florida black bear habitats
- D. Carrying capacities of Florida black bear habitats

## VI. Factors influencing the survival of the Florida black bear

- A. Natural limiting factors
  - 1. Starvation
  - 2. Disease/parasites
  - 3. Predation, drowning and other injuries
- B. Human-caused limiting factors
  - 1. Habitat destruction/alteration/fragmentation
  - 2. Poisoning/shooting/trapping
  - 3. Road kills
- C. Relationship between human population growth and Florida black bear mortality

## VII. Ecological significance of the Florida black bear

- A. The role of the Florida black bear as an umbrella and indicator species
- B. Other organisms found in Florida black bear habitats

## VIII. Status of the Florida black bear

- A. Past and present geographic distributions of Florida black bears
- B. Past and present populations of Florida black bears

## IX. The future of the Florida black bear

- A. Minimum numbers needed to sustain healthy Florida black bear populations
- B. Strategies for minimizing human-caused Florida black bear mortality
- C. Strategies for restoring, protecting and connecting areas of Florida black bear habitat



## Glossary

- **Attitude** - A positive or negative feeling about something.
- **Carnivore** - An animal whose diet consists primarily of animal matter, such as a panther, an alligator, or an eagle.
- **Carrying Capacity** - The largest number of organisms of a given species that an area of habitat can support on a year-round basis.
- **Conservation Area** - An area of wildlife habitat that is large enough to meet the needs of a population of a particular species and is targeted for protection and preservation.
- **Cub** - A young animal, like a bear, that is less than one year old.
- **Digitigrade** - An animal that walks on its toes, such as a dog, a cat, or a horse.
- **Emigration** - The movement of organisms out of an area.
- **Endangered** - A species that is in danger of becoming extinct throughout its natural range.
- **Foraging** - A type of feeding behavior whereby an animal, such as a Florida black bear, meanders through an area feeding on appropriate food items it comes across.
- **Freshwater Swamp** - A plant community, found in low-lying forested areas and along river and lake edges that is flooded for at least part of the year and is dominated by a dense canopy of trees such as cypress, bay, maple, or black gum.
- **Genus** - A group of species with common characteristics.
- **Habitat** - A natural area that provides the basic requirements an organism needs to survive.
- **Habitat Corridor** - An area of land or water that connects isolated areas of wildlife habitat.
- **Habitat Fragmentation** - The process of breaking larger areas of habitat into smaller pieces, often as a result of human development activities such as road building and urbanization.
- **Habitat Loss** - The permanent alteration or conversion of natural habitat for human use.
- **Habitat Mosaic** - The combination of different habitats a wide-ranging species, such as the Florida black bear, needs in order to survive.
- **Herbivore** - An animal whose diet consists primarily of plant matter, such as a rabbit, a deer, or a mouse.
- **Home Range** - The area of habitat regularly used by an animal during a year.
- **Immigration** - The movement of organisms into an area.
- **Indicator Species** - A species whose population size and health is used to gauge the overall health of an ecosystem. For example, if an area supports a healthy, adequately sized population of Florida black bears, the ecosystem in that area is considered to be healthy.
- **Limiting Factor** - Factors such as food, water, shelter, and space that determine the maximum number of organisms that can survive in a given habitat.



- **Marginal Habitat** - A habitat that provides minimal or less than ideal amounts of food, water, shelter, space, and other habitat requirements for a particular species.
- **Mortality** - Death
- **Omnivore** - An animal whose diet consists of a mixture of plant and animal matter, such as a raccoon, a human, or a Florida black bear.
- **Optimal Habitat** - A habitat that provides enough food, water, shelter, space, and other habitat requirements to support a healthy population of a particular species of organism.
- **Pine Flatwoods** - A plant community dominated by an open canopy of longleaf, slash or pond pine trees that is usually found in low-lying flat areas containing wet soil during the summer months and dry soil throughout the rest of the year.
- **Plantigrade** - An animal that walks on the flat soles of its feet, such as a bear, a human, or a chimpanzee.
- **Population** - A group of organisms of the same species living in the same area.
- **Roadkill** - An animal killed by a car, train, or other moving vehicle on a road.
- **Sand Pine Scrub** - A plant community usually found in hilly areas that contains a thick layer of well-drained sandy soil and is dominated by a sparse canopy of sand pine trees and smaller oaks.
- **Species** - A group of organisms that can breed and produce fertile offspring.
- **Subspecies** - A geographically isolated subgroup of a species that has developed unique, distinguishing traits.
- **Threatened Species** - A species that is likely to become endangered in the near future.
- **Umbrella Species** - A species of animal that utilizes large natural areas of habitat containing many different kinds of plant and animal species. Thus, if habitat for the umbrella species is protected, habitat for many other species of organisms is protected as well.
- **Yearling** - A young animal that is between one and two years old.

