# Everglades EDUCATOR



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### A LETTER FROM THE DIRECTOR

### What a Year!

he power of community collaboration coupled with teacher superpowers has launched the Everglades Literacy Program across the state. Everglades restoration will take the continued commitment of future generations, which is why our "Everglades Literacy" program is so critical. It is a comprehensive framework to provide the next generation the knowledge — and the passion that will be needed if we are to protect this fragile and threatened ecosystem.

The Everglades Foundation is incredibly excited as we enter our 4th year of the Everglades Literacy Program. As students across Florida eagerly get back to their classrooms to explore, experiment, and enjoy learning about the world that surrounds them, we are encouraged to see that Everglades will be embedded in the many subjects they study.

The Everglades Literacy program's partnership with Florida Atlantic University's Pine Jog Environmental Center kicked off in 2013, and has provided K-12 students with a keen understanding of one of the most unique ecosystems on the planet — America's Everglades.

We look back with gratitude

for the teachers and students who are leading the way in supporting Everglades literacy and conservation in our classrooms, on our school campus, and in our community.

Collaboration is key and thanks to your support, we have reached over 2,000 teachers from nineteen Florida school districts - Broward. Charlotte, Collier, Escambia, Hendry, Hillsborough, Lee, Leon, Martin, Miami-Dade, Monroe, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Seminole, and

We are inspired by the potential



to reach 1,969,091 students and plan to add new districts with the support of our amazing foundation and corporate partners.

During the 2017-18 school year, we will leverage our success and expand opportunities for teacher trainings, citizen science projects, and fieldtrips. In addition to broadening our Everglades Champion Schools program, we will launch five high school curriculum units - Biology, Chemistry, Environmental Science, History and English.

We hope you enjoy the Inaugural issue of "Everglades Educator". For more information about this curriculum and the Everglades Foundation, please contact Jennifer Diaz, Director of Education at jdiaz@evergladesfoundation.org. The Everglades Foundation is a leading non-profit organization dedicated to protecting the Everglades and the millions of Floridians that depend on it for their water supply.

We look forward to an incredible year of educating the future stewards of America's Everglades!

Sincerely,

Jennifer Diaz Director of Education. The Everglades Foundation JDiaz@evergladesfoundation.org



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## A Trip Down Tamiami Trail

By Dr. Kristie Wendelberger

t's a cool 78 degrees F; The sun is shining; sporadic white puffy clouds are hovering in the sky; and we are traveling in a shuttle bus east on Tamiami Trail about to cross the newly opened one mile bridge on a day tour of the Everglades.

As we incline up the bridge, the expanse of wetland landscape on either side goes as far as the eye can see. To the north is Water Conservation Area 3A (WCA3A), a matrix of open sloughs, ridges of sawgrass, and scattered tree islands. To the south is Everglades National Park (ENP), which also has islands and sawgrass, conspicuously absent are the open slough waterways found in the northern area. I wish I could've seen the Everglades before water management, back when there was sheet flow.

Water once moved freely from the Kissimmee Chain of Lakes, down into Lake Okeechobee, through the Everglades River of Grass, and into Florida Bay. Today, the water stopped by a dike surrounding Lake Okeechobee, an agricultural area, a series of levees, canals, and hundreds of water control structures. To the right of the shuttle is a dike holding water in Tamiami the WCA3A, Canal shunting freshwater off the Atlantic Ocean, and Tamiami Trail blocking most of the water that would otherwise flow into ENP. Water flowing under the newly opened bridge into ENP is just starting to make paths through the dense sawgrass, slowly recreating meandering cuts that will eventually become open sloughs. Suddenly, a Wood Stork soars up from the Pond apple trees along the road into the

trees along the road into the blue sky, catching my eye and bringing me back to the shuttle bus. The bird

A Cape Sable
Seaside

**Sparrow** 





slowly beats its wings as it flies over the tree line searching for a spot to feed. Wood Storks are huge, majestic, white birds with deep black flight feathers and black, bald heads; they are beautiful and listed as federally threatened. Prior to the 1960's, the Everglades once supported 14,000 to 20,000 pairs of Wood Storks. Currently, there are fewer than 1,000¹ nesting pairs in south Florida. It turns out that Wood Storks rely on the open slough, sawgrass ridge, and tree island matrix that the Everglades are losing from all the dikes, canals, and

water management. These tall birds are voracious eaters during nesting times. A breeding pair can eat 200 kg of freshwater fish and other species while nesting, and they won't build a nest if there isn't enough food. I watch out the window as the Stork lands at the edge of a newly forming slough, moves its beak slowly back and forth through the water, and with a speed that rivals no other known vertebrate, closes its beak down on what looks to be a sunfish. We are now descending the bridge and the Wood Stork becomes hidden in the tall sawgrass. It's not far down the road before we pass construction that will eventually be another 2.5 miles of bridging opening up more water flow allowing more Wood Stork habitat to develop.

The Wood Stork is used to interpret the health and history of the Everglades, making it an extremely important indicator species. Their habitat needs are water quality and quantity specific, so the population number of wood storks offer signs of ecosystem health<sup>2</sup>. They were listed as federally endangered for 30 years until they were down-listed to federally threatened in 2014, which the U.S. Fish and Wildlife Service believes is due to successful conservation efforts. Like the American alligator, there is hope that the Wood story will become another inspiration for both current and future conservation projects surrounding the Everglades.

<sup>1</sup>Cook, M.I. and M. Baranski (Eds.). (2017). South Florida Wading Bird Report. Vol 22:1-47. South Florida Water Management District. West Palm Beach, FL. <sup>2</sup>Frederick, P., D.E. Gawlik, J.C. Ogden, M.I. Cook, M. Lusk. (2009). The White Ibis and Wood Stork as indicators for restoration of the everglades ecosystem. *Ecological Indicators*. 9S:S83-S95.

# Schools Take the Lead as Everglades Champions



uring the 2016-2017 academic school year ten remarkable South Florida schools became the state's first "Everglades Champion Schools," leading the way to make Everglades literacy a fundamental part of their students' learning and campus life.

These schools were participants in the pilot year of the Everglades Champion Schools Recognition Program (ECSRP), an innovative new program developed by The Everglades Foundation in partnership with Florida Atlantic University's Pine Jog Environmental Education Center.

The ECSRP recognizes schools as critical partners in Everglades conservation. The goal of the program is to support and celebrate schools that make Everglades literacy a core part of their learning culture and that engage and empower students as the future stewards of the River of Grass.

Modeled on FAU Pine Jog's successful Green Schools Recognition Program, the ECSRP encourages schools to develop Everglades initiatives in five key areas:

- Professional development
- Curriculum integration
- Inquiry- and project-based learning
- School leadership, and innovation

Participating schools document their activities in each area and submit an application at the end of the school year to earn points toward recognition as a Bronze, Silver, or Gold-level Everglades Champion School.

This year's inaugural class of Everglades Champion Schools included three Gold Champions, five S ilver C hampions, a nd one Bronze Champion. All of these schools worked to bring the Everglades home to their students — and bring their students home to the Everglades — with engaging environmental lessons, exciting field trips, and interactive projects that transformed their classrooms, hallways, and school Everglades-inspired grounds into



The Everglades Foundation has awarded \$10k to Florida schools through the Everglades Champion Schools grant. These funds are used to get kids out into the Everglades through exploratory field trips.



Second grader, Luke Hernandez, excited to share his knowledge about the Florida Bobcat.

panoramas and living laboratories. All schools will receive banners, certificates, and accolades for their efforts at special presentations this fall.

Among these first-time participants, the program received high marks for providing teachers with the Everglades Literacy Toolkit, a "fun and easy" way to integrate the Everglades into their curriculum. The Toolkit, a series of hands-on, K-12 lessons first developed by the Everglades Foundation and FAU Pine Jog in 2014, is the cornerstone of the Champions program. The Everglades Literacy Toolkit lessons, materials, and one day teacher workshops are all provided by The Everglades Foundation at no charge for schools throughout the state — and are required for Champion Schools.

"I loved having the Everglades lessons that are able to be taught to students of all levels" said Lori Vanis of Pine Jog Elementary, a Gold-level Champion this year. Erin Mitchell of Palm Beach Day Academy agrees: "I absolutely love this program and am hopeful that more teachers from our school will implement lessons based on the Everglades.

This [program] will help get the word out!"



Students from North Hialeah Elementary celebrate their designation as a 2017 Everglades Champion Gold Level school.

The edgling ECSRP also earned praise from teachers for providing a "very clear and easy to understand" evaluation criteria and point system and responsive, on-hand staff support. "One of the most helpful aspects of the program is the assistance and support that was available at any time," said David Martin II, Interim Principal at Eagle Point Elementary in Broward County.

Other participating teachers expressed appreciation for the way the program inspired their students with a desire to visit the Everglades for themselves—and the financial support to take them there. "Seeing students get excited about the Everglades and wanting to go!" was one of the best aspects of the program for Jessica Hernandez, a teacher at Gold-level North Hialeah Elementary. "It's amazing how many students have not been there," she added.

To help schools on that score, The Everglades Foundation provided each participating school with grant money for field trips and additional educational materials. Colleen Pollett, a teacher at Galaxy E3 Elementary, expressed her thanks for that additional support: "We were able to send 150 3rd grade students

on a field trip to Green Cay Nature Center," a trip that "would not have been possible without the grant."

Still other teachers praised the ECSRP for the impact it had on their school's sense of community and shared purpose.

"I LOVED that our school was an Everglades Champion school!" enthused Jessica Hernandez of North Hialeah Elementary. "I felt that our students knew they were a part of something really important, especially my Everglades Ambassadors," a student club inspired by the ECSRP criteria.

Rosa Hernandez of Sweetwater Elementary, a Gold-level Champion, noted that the program "brought our school closer together working toward a common goal." Echoing these words, Janine Fernandez of Sunset Park Elementary added that participating "allowed me to talk to teachers that I have not had the chance to work with in the past. It was a wonderful experience."

As the ECSRP looks ahead to the 2017-18 school year, it hopes to build on the momentum of these Everglades-inspired teachers and administrators. The program hopes to expand to reach up to 30 schools in five counties this year.

### 2017 EVERGLADES CHAMPION SCHOOLS



North Hialeah Elelmentary STEM Magnet School Miami-Dade

Pine Jog Elementary
Palm Beach

Sweetwater Elementary

Miami-Dade



Galaxy E3 Elementary
Palm Beach

**Lake Park Elementary** *Collier* 

Palm Beach Day Academy
Palm Beach

Sunset Park Elementary
Miami-Dade

Beachside Montessori Village

Broward



**Eagle Point Elementary** *Broward* 

"I am so glad my school was able to participate in this program, and I hope that more and more teachers become involved in years to come," said Ms. Pollett at Galaxy E3. The ECSRP couldn't agree more.

For more information about how your school can become an Everglades Champion, please contact Alicia Torres at 561-686-6600 or <a href="mailto:evergladeschampion@ever

# Joining Together to Train the Future

"I feel really confident in being

able to teach this to the kids and

help them become part of the

change for the future."

Orange County School Teacher



eaWorld Parks & Entertainment and The Everglades Foundation partnered together with one main goal: Educate young Floridians about the importance of saving America's Everglades. To date, the Everglades Literacy Curriculum has reached more than 2,100 teachers and over 80,000 students across 17 counties in Florida. These lessons are

aimed at stressing the importance of the priceless economic, ecological, and hydrological values of the Everglades.

Teachers are given the opportunity to attend training workshops hosted at SeaWorld Orlando, where they receive information and materials to bring back to their students and schools. SeaWorld has supported the Everglades Literacy Program with

a three-year grant and funding for teacher trainings at its parks. During those three years, the literacy program will have impacted 840 teachers—280 each year.

There has been positive feedback from teachers regarding the information learned at the training. Kids are enjoying the curriculum, learning new information about their home state that they did not know before, and interacting with the program's activities.

"I think it is pivotal for teachers to be educated on such a precious resource like the Everglades, so we can enlighten and empower our students to make changes to benefit the Everglades," shares Josh Pederson, a teacher at

shares Josh Pederson, a teacher at SunRidge Elementary in the Orange County Public School System.

"At SeaWorld, we inspire people every day to explore nature and to find ways they can become better stewards of the natural resources they share with millions of animals," said Brandon Tidwell, Director of Corporate Responsibility for SeaWorld Parks & Entertainment.

"Because the Everglades begin here in Orlando, at Shingle Creek, we thought it was critical to partner with the Foundation to educate and inspire our youth to protect, preserve and repair this valuable ecosystem for the benefit of the citizens of Florida and the animals who call it home."





SeaWorld Parks and Entertainment aims to inspire people to protect and care for the animals n the planet through its entertainment, research, teaching, and rehabilitation programs.

The Everglades Foundation's education team prepares to train 60 Hillsborough County Public School teachers at Busch Gardens.



# Grade 4 - Lesson 2

### Wanted - Alive!

#### **Grade Level: 4th**

#### **Objective:**

Students will be able to:

 Explain the threats to animals in certain Everglades habitats and why they are threatened or endangered.

#### Standards:

- SC.4.L.17.4 Recognize ways plants and animals, including humans, can impact the environment.
- LAFS.4.W.3.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic.

#### Everglades Literacy Conceptual Framework Connections:

Fundamental Concept 6

• Fundamental Concept 7

**Duration:** 60 minutes

#### **Materials:**

- <u>Everglades</u> by Jean Craighead George
- List of Everglades Threatened or Endangered Animal Species
- Internet access or other sources of information OR copies of data
   sheets
- Crayons, colored pencils, pictures from Internet
- 11" by 17" or chart paper for posters
- Poster Rubric

#### At A Glance:

Students will learn about the threatened and endangered animal species in the Everglades. Students will also create a poster on a threatened or endangered species.

#### **Background:**

**Threatened** wildlife include species of plants and animals that are likely to become endangered in the near future, unless steps are taken to protect and manage the species and/or its habitat for its survival. A species is considered **endangered** if it is, or soon may be, in immediate danger of **extinction** unless the species or its habitat is fully protected. Each species must be listed on the Federal list of Endangered and Threatened Species before it can receive protection under the Endangered Species Act (ESA). The ESA was enacted in 1973 to conserve and set up recovery plans for listed species and their associated habitats.

In addition to the Federal list of Endangered and Threatened Species, the state of Florida maintains its own endangered species list: The State of Florida's Endangered and Threatened Species List. The Florida Fish and Wildlife Conservation Commission (FWCC) maintains the state list of animals designated as Federally-designated Endangered or Threatened, state-designated Threatened, or state-designated Species of Special Concern. All Federally listed species that occur in Florida are included on Florida's list. In addition, the state has a listing process to identify species that are not Federally listed but at risk of extinction.

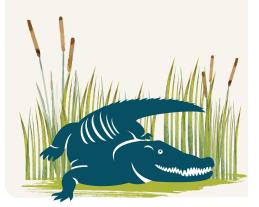
The American alligator is a success story. It was first listed as endangered in 1967 in accordance with a law that preceded the ESA. However, populations quickly recovered, resulting in delisting it as an endangered species. It is still listed as threatened on the Federal list of Endangered and Threatened Species due to its similarity of appearance to the American crocodile for purposes of protection where the two species share habitat, such as the Everglades.

#### **Preparation:**

- Some suggested websites for student research are:
   <u>Florida Museum-Threatened & Endangered Species</u>,
   <u>U.S. Fish & Wildlife Service</u> (Hint: Use searchable database by state and animal), and <u>National Park Service</u> (Hint: Use search box).
- If access to computer lab is not available, you can search
   <u>The Everglades Foundation</u> website to make photocopies of reference sheets for students available (Search for Grade 4, Lesson 2)-(optional).

#### Vocabulary:

- **Endangered** Plants and animals that are, or soon may be, in immediate danger of extinction unless the species or its habitat is fully protected and managed for its survival.
- **Extinction** When a plant or animal species no longer exists.
- Threatened Plants and animals that are acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range/habitat is decreasing in area at a rapid rate and, as a consequence, is very likely to become endangered in the foreseeable future.



#### **Procedure:**

- 1. Read the book **Everglades** by Jean Craighead George to the class. Ask students to think about the different sources of information that they have investigated over the last few lessons and discuss how the Everglades has changed over time.
- 2. Ask them how they think the 'good story' is turning out. Explain that many animals in the Everglades are threatened or endangered. Ask students what they think the terms threatened and endangered mean. Use background information to elaborate. Explain that in some cases, animals that were once endangered, like the American alligator, have been able to recover because laws were put in place to protect them and are now considered threatened or stable. Tell students that they are going to research a current Everglades threatened or endangered species.
- 3. Randomly assign to each student one of the endangered or threatened species from the list of animal species provided. Hand out the "Wanted-Alive!" rubric, one for each group. Review the rubric with the students so that they have a clear understanding of the assignment expectations.
- 4. Explain that they will use internet sources to find information on their endangered or threatened species to make a "Wanted-Alive!" poster. Access additional teacher tips on research at the elementary level.
- 5. Take them to a website of your choosing, use the suggested websites, or print fact sheets to demonstrate how to search for the needed information. Suggested research sites:
  - Florida Museum-Threatened & Endangered Species
  - U.S. Fish & Wildlife Service (Hint: Use searchable database by state and animal)
  - National Park Service (Hint: Use search box)
- 6. Student posters should include:
  - A physical description of their species and a picture
  - Type of habitat they live in
  - Predator/prey relationship (what do they eat/what eats them)
  - Human impacts and how they threaten the species survival
  - Factors/threats contributing to species being endangered/ threatened (i.e. poaching, habitat degradation, invasive species, and increased predation)
  - What is being done or what we can do to protect them

#### Assessment:

1. Students should complete a poster with all required components. Have students present their posters, then display their posters around the room for an Everglades Threatened and Endangered Species Gallery. Tell students that during the gallery walk their task is to pick three species besides their own and record at least one threat for each of those species. Use the Wanted-Alive! poster rubric to score each poster.

#### Resources:

FAU/Pine Jog Environmental Education Center.

(n.d.) Endangered Species "Wanted - Alive!" In Exploring the Everglades: Teacher's Guide Lesson Plans for Elementary School (Lesson 6). Retrieved from http://www.evergladesfoundation.org/what-we-do/curriculum/

George, J. C. (1995). Everglades. New York, NY: HarperCollins Children's Books.



### **EVERGLADES CURRICULUM** Grade 4 - Lesson 2



## THREATENED AND ENDANGERED ANIMAL SPECIES OF THE EVERGLADES

SPECIES	FEDERAL STATUS
American Alligator Alligator mississippiensis	Threatened
American Crocodile Crocodylus acutus	Threatened
<b>Kemp's Ridley Sea Turtle</b> <i>Lepidochelys kempi</i>	Endangered
Cape Sable Seaside Sparrow  Ammodramus maritime mirabilis	Endangered
Eastern Indigo Snake Drymarchon corias couperi	Threatened
<b>Florida Panther</b> Puma concolor cory	Endangered
<b>Green Sea Turtle</b> Chelonia mydas	Endangered
<b>Hawksbill Sea Turtle</b> <i>Eretmochelys imbricata</i>	Endangered
<b>Key Largo Cotton Mouse</b> Peromyscus gossypinus allapaticola	Endangered
<b>Key Largo Woodrat</b> Neotoma floridana smailli	Endangered
<b>Leatherback Sea Turtle</b> Dermochelys coriacea	Endangered
<b>Loggerhead Sea Turtle</b> <i>Caretta caretta</i>	Threatened
<b>Piping Plover</b> Charadrius melodus	Threatened
<b>Red-Cockaded Woodpecker</b> <i>Picoides borealis</i>	Endangered
<b>Roseate Tern</b> Sterna dougaillii	Threatened
Schaus Swallowtail Butterfly Papilio aristodemus ponceanus	Endangered
<b>Everglades Snail Kite</b> Rostrhamus sociabilis plumbeus	Endangered
Stock Island Tree Snail Orthalicus resee	Threatened
<b>West Indian Manatee</b> <i>Trichechus manatus</i>	Threatened
<b>Wood Stork</b> Mycteria americana	Threatened

# Find the ENDANGERED species in the word search. Hint: the words are CAPITALIZED in the fact bubbles!

The **SNAIL KITE's**bill is adapted
specifically for its
primary food, the
apple snail, that lives
in the shallow
marsh.



The Cape Sable **SEASIDE SPARROW** nests low to the ground, preferring to live in prairie habitats.

The Florida

**BONNETED BAT** can be found in wetlands

or forested habitats

where it can roost in crevices.

TO THE TAX TO THE TAX

Name:

S E R U W J I S B M Q D G G H I E E O D J QE VZ F Q F C N T Y S P L Z X I N A ZGDWORRAPSEDISAESAVH ORXHZRMARSHRABBI TNMX WOODSTORKFEWGRUABRLY DREHTNAPADI ROLFKOEPS CPJ RI NS KI HRLKAVRNTP V LTSMBSTDMQRSCFJWNEWA QJ S D Q H B F N Q N G S M U I E T I T F X U C U Z B C V J E F W R J Y T A W S WI I WAOCSAWFISHPHEEBE OYQLBFYHAKYQHOWADSTA GONEVZYETI KLI ANS BOAT ROTAGILLANACI REMAROU CBEUNFXCEAOJ YI HGTBGR WVUGTI TBKQWI VYBJGSHT

H S A A S Y Y H E W X B J P I Z E H I N J Y P P H L M G V P C V E T Y Z C D I E

The FLORIDA
PANTHER favors
upland forests, where
their diet is made up
of 90% feral hog,
white-tailed deer,
raccoon, and
armadillo.

The small-toothed **SAWFISH** is usually found in estuaries and bays for the mangroves, mud/sand bottom, reefs, seagrass and oyster bars.



The Kemp's Ridley
SEA TURTLE mostly
relies on crabs, but
may also eat
invertebrates and
plants in their
diets.

XZYSHAXAHXZOXHXOMCTL

APXNOGCWTFCHMYKCMCME



The Lower Keys
MARSH RABBIT
can be found
in pinelands,
freshwater
marshes, and
coasta prairies.



# SARAZENG

### MISS FLORIDA 2017

The Everglades Foundation is a proud sponsor of the Miss Florida Scholarship Pageant, Inc.









The Everglades Foundation is proud to partner with Miss Florida Scholarship Pageant, Inc. and share the importance of protecting America's Everglades. Serving as an ambassador, Miss Florida travels the state bringing the Everglades restoration message to schools, policy makers, and the public.

The Everglades Literacy Program is designed for K-12 teachers to help raise awareness about America's most important wetland ecosystem, focusing on themes like water quality, habitats and animals, invasive species, etc. Our Everglades literacy teacher trainings provide teachers with a hands-on introduction to the lessons designed for their grade levels.

### **Everglades Fun Facts**

- One out of every three Floridians rely on the Everglades for their water supply.
- Once spread out over 8 million acres, the Everglades ecosystem reaches from the Kissimmee River to Lake Okeechobee, where waters from the lake slowly move towards Florida Bay.
- America's Everglades is home to 73 threatened or endangered species.



#### John Marshall Everglades Intern, Education

Annalee Maloney was the 2017 John Marshall Everglades Education Intern at The Everglades Foundation. She is a student at the University of Florida, currently majoring in Zoology. She is originally from Jupiter, where she was part of the Jupiter Environmental Research and Field Studies Academy at Jupiter High School. In her free time, she enjoys walking outside and going to the beach. Out in the field, she always says, "If you're not sweaty or dirty, you're not doing it right."





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