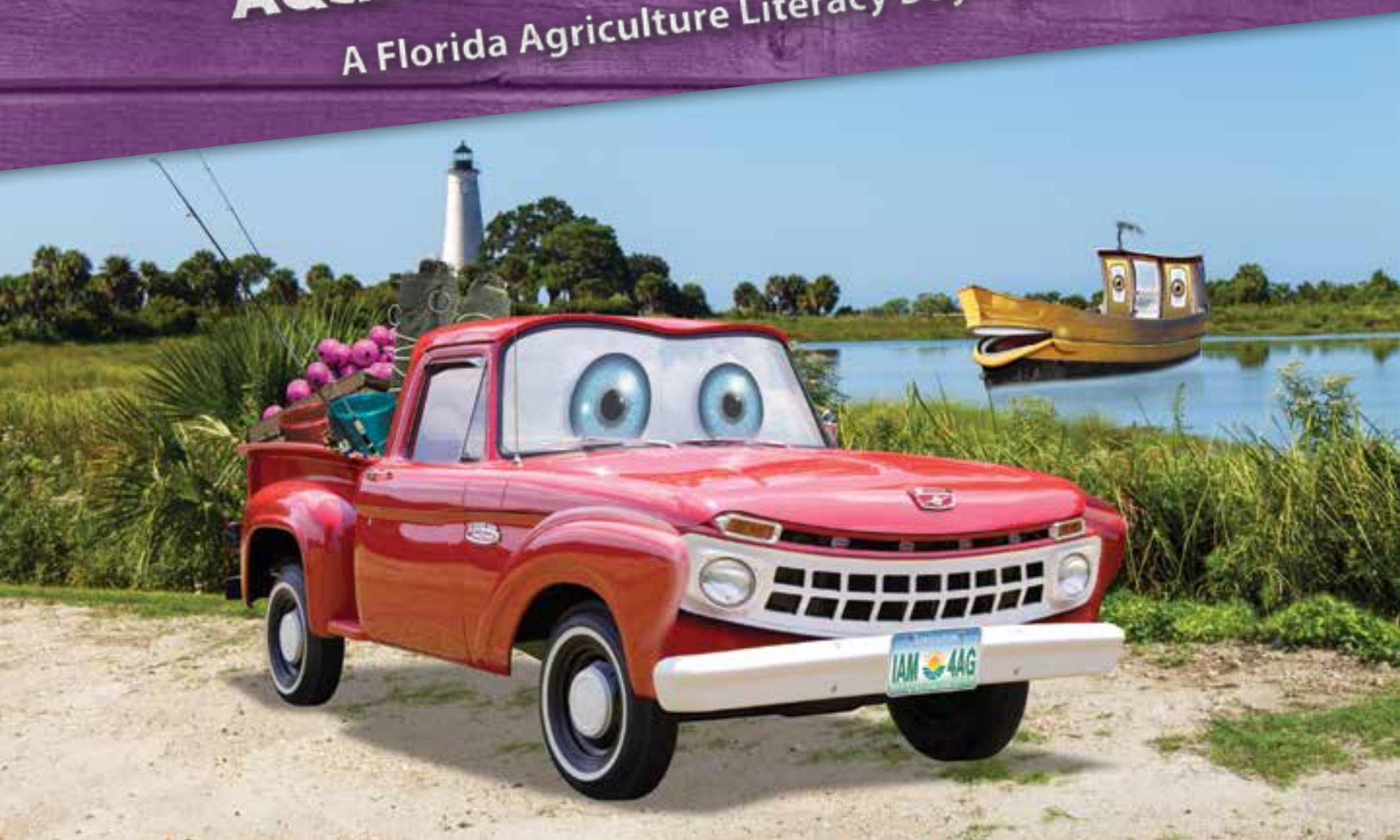




# DRIVE THROUGH FLORIDA

## AQUACULTURE AND SEAFOOD

A Florida Agriculture Literacy Day Book





## **FLORIDA AGRICULTURE LITERACY DAY**

is an annual event held each spring in which hundreds of agriculture industry representatives read a designated children's book about agriculture in elementary school classrooms around the state. The event is a partnership between Florida Agriculture in the Classroom, Inc. and the Florida Department of Agriculture and Consumer Services.

## **FLORIDA AGRICULTURE IN THE CLASSROOM**

is a non-profit organization charged with educating Florida teachers and students in kindergarten through 12th grade about the importance of Florida agriculture. It is funded by sales of the agriculture specialty license plate known as the "Ag Tag." Florida Agriculture in the Classroom is able to provide Agriculture Literacy Day books and other related items free of charge because of the funding it receives from the Ag Tag.



# **DRIVE THROUGH FLORIDA**

## **AQUACULTURE AND SEAFOOD**

**A Florida Agriculture Literacy Day Book**

**Written by**  
Arlette Roberge

**Illustration and Design by**  
Douglas Gillespie and Mark Cason

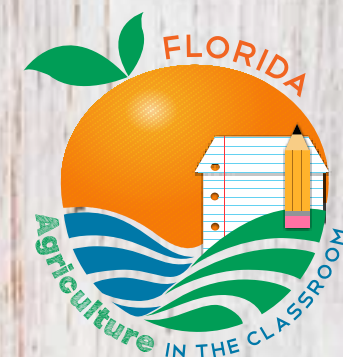


**Florida Department of  
Agriculture and Consumer Services**

Commissioner Adam H. Putnam



[www.FreshFromFlorida.com](http://www.FreshFromFlorida.com)



**"Educate Students About Florida Agriculture"**  
(352) 846-1391 [www.AgTag.org](http://www.AgTag.org)

Special thanks to Florida Farm Bureau's Women's Committee for their support.



# AHOY MATES!







I'M OL' RED.  
WOULD YOU LIKE  
TO VISIT AN  
UNDERWATER  
FARM?

Let's travel through  
Florida and along its coasts.  
We will visit aquatic farmers  
called "aquaculturists." They work  
in a specialized area of agriculture  
called "aquaculture." These farmers  
grow aquatic species in water  
instead of soil.

They  
have special spots  
in oceans, ponds and  
tanks where they raise  
fish, shellfish, reptiles  
and plants.



## DRIVE THROUGH FLORIDA AQUACULTURE

- 1  **ALLIGATORS**  
(Page 4-5)
- 2  **AQUARIUM FISH  
AND PLANTS**  
(Page 6-7)
- 3  **HARD CLAMS**  
(Page 8)
- 4  **OYSTERS**  
(Page 9)
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(Page 10)
- 6  **TILAPIA**  
(Page 11)





# ALLIGATORS



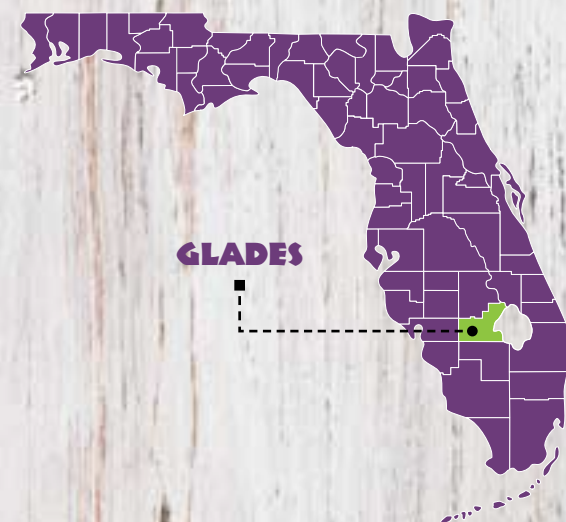
Let's start  
in Glades  
County and visit  
an alligator  
farm.

Alligators are a little scary but what do you expect from a dinosaur's cousin? There are more than 20 alligator farms in Florida that raise these reptiles for their hides and meat. Purses, boots, wallets and belts can be made from alligator hides.



Douglas Gillespie

**GATOR LEATHER BOOTS  
AND HANDBAGS**

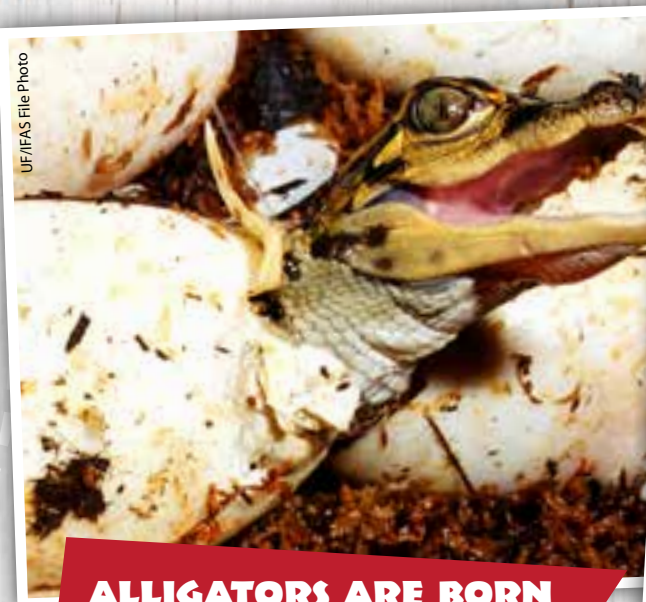


GLADES

Some people think alligator meat tastes like chicken or veal.

Alligators enjoy Florida's sunshine, and eat almost anything including insects, fish, turtles and birds.

Alligator farmers can breed their gators or collect wild alligator eggs from nests found in swamps and marshes. The gator farmer hatches the eggs and grows the hatchling up to three to four feet in length before harvesting.



UF/IFAS File Photo

**ALLIGATORS ARE BORN  
FROM EGGS**



**ALLIGATOR  
MEAT**



At one time, alligators almost became extinct. They are a protected species now, which means they can only be hunted or farmed with a special permit. We now have lots of alligators on farms and in the wild.



**ALLIGATORS LIKE  
SUNNY SPOTS**

## FUN FACTS



GATORS CAN LIVE FOR  
MORE THAN  
**50 YEARS**  
AND WEIGH OVER  
**1,000  
POUNDS.**



THEY GET NEW  
**TEETH**  
WHEN THEY WEAR OUT  
THEIR OLD ONES.



A GROUP OF ALLIGATORS  
IS CALLED A  
**CONGREGATION.**





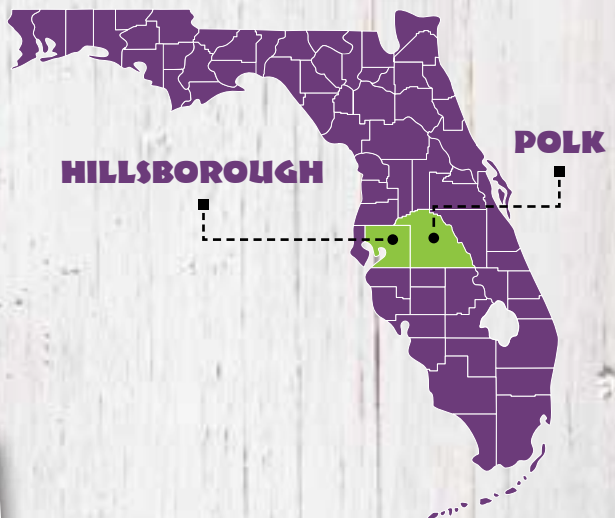
LEFT TO RIGHT: ANGEL FISH, TETRAS AND BARBS (TOP RIGHT)



# AQUARIUM FISH AND PLANTS

Let's visit the farmers raising colorful tropical fish in Hillsborough and Polk Counties.

There are hundreds of varieties of tropical fish and aquatic plants raised in Florida. Some are grown in outdoor ponds and some are raised in indoor tanks. In Florida, we ship freshwater and saltwater fish and aquatic plants worldwide for aquarium lovers.



OUTDOOR TROPICAL FISH FARM POND

How are farmers able to grow so many fish and plants? Florida has lots of warm weather and good quality ground water. Farmers know how to breed fish and plants to be hardy and healthy. And they know how to keep water in ponds and tanks very clean.



GOURAMI

Some fresh water fish species raised in Florida include mollies, swordtails, gouramis, angelfish, tetras and barbs. There are more types of plants than you can ever imagine. We do not eat these fish or plants. They are raised so we can enjoy their beauty.

# MARINE ORNAMENTALS

Many marine species are also farmed for aquariums. These saltwater species include corals, clownfish, live rock, gobies, seahorses and more.

Corals can be cut into smaller pieces to grow a new colony. This creates more coral for aquariums without collecting it from the oceans.

Nemo in "Finding Nemo" was a clownfish. Since the movie came out, lots of people have added clownfish to their saltwater aquariums.

Live rock is not alive but is full of tiny marine life that live on and inside it. Live rock helps clean and filter aquarium water.



GROWING NEW COLONIES OF CORALS



SEAHORSES CAN GRASP OBJECTS WITH THEIR TAILS



CLOWNFISH LIKE TO HIDE IN ANEMONES



A SCARLET CLEANER SHRIMP PERCHED ON LIVE ROCK

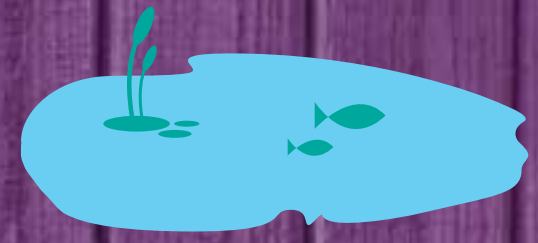
# FUN FACTS

MORE THAN 500,000 BOXES OF FISH AND PLANTS ARE SHIPPED FROM FLORIDA EACH YEAR.



AQUARIUMS HELP REDUCE STRESS.

PEOPLE ALSO BUY GOLDFISH, KOI AND PLANTS FOR OUTDOOR PONDS.







GROWTH RINGS INDICATE A CLAM'S AGE

Levy County raises the most hard clams. Let's go see them!



# HARD CLAMS



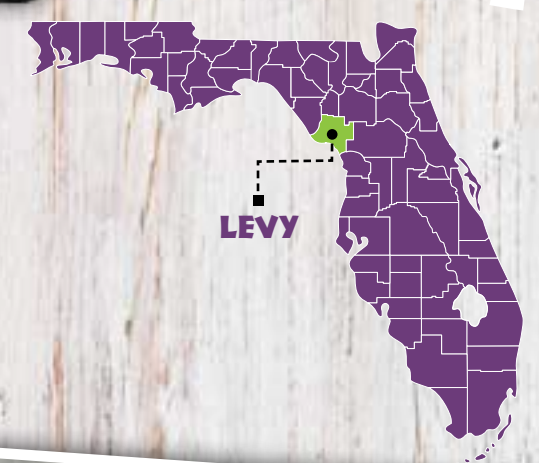
CLAM FARMER

Hard clams are called middle necks and little necks. But I've never seen a clam's neck, have you? A hard clam has two hinged hard shells to protect its tasty soft muscle.

Florida clam farmers use bags to grow clams on the ocean floor. The bags protect small clams from predators. Farmers let clams grow for about one year before they are harvested.

Clam farming keeps bays and oceans clearer and cleaner. As clams feed and grow, they clean the water by filtering it in and out of their shells.

They use nutrients in the water to grow their shells. So, not only are clams great to eat, they are also very helpful for the environment.



# OYSTERS

Franklin County has some of the best oysters in the country!



Oysters have a soft body protected by an outer shell, but an oyster's shell is very rough and can cause painful cuts if you aren't careful where you walk.

Oysters live in shallow bay areas where the ocean tide meets river streams. If oysters do not get the right mixture of fresh and salt water, they cannot survive.

Oysters are grown in cages to protect them from predators. In addition to farming, some fishermen use small boats and long tongs to gather wild oysters. Oysters are important because they help keep the water clean by filtering it.



OYSTERS ARE OFTEN EATEN RAW



CAGE-GROWN OYSTERS



OYSTER BED

# FUN FACTS

CLAMS CAN BE EATEN STEAMED, FRIED, GRILLED, BAKED OR IN CLAM CHOWDER.



CLAMS WERE A MAJOR FOOD SOURCE FOR THE NATIVE INDIGENOUS TRIBES OF FLORIDA.

OVER 125 MILLION FLORIDA CLAMS ARE HARVESTED EACH YEAR.

YOUNG OYSTERS ARE CALLED SPAT.



PEARLS ARE FORMED WHEN AN INTRUDER GETS INSIDE AN OYSTER'S SHELL, AND THE OYSTER COATS IT WITH 'NACRE.'



# STURGEON

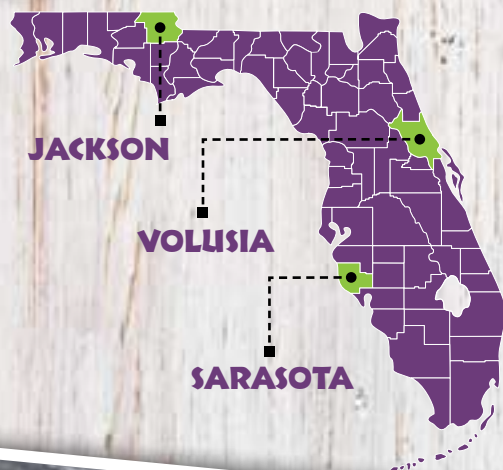
Sturgeon are raised for their eggs which are caviar and their high quality meat. In the wild, they can grow very large (about eight feet) and live up to 50 years. Sturgeon are often referred to as living fossils because they have survived virtually unchanged for more than 100 million years.



STURGEON CAVIAR

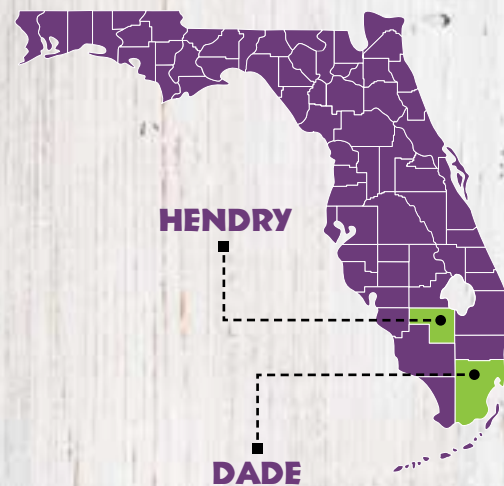


TANK-RAISED STURGEON



Sturgeon are raised in Volusia County and in other areas of the state.

# TILAPIA



Let's travel south to Hendry County to see tilapia farms. Dade County also has lots of tilapia farms.

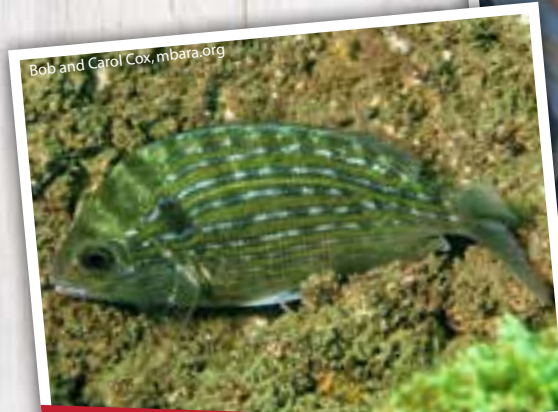


TILAPIA



TILAPIA TANK

Tilapia is raised as food to eat. It is the most abundant food fish farmed throughout the state, but they are native to Africa. This fast-growing fish eats a vegetarian diet. Tilapia can grow in ponds, raceways, floating cages and tanks. When they are about six months old, they are ready to be harvested.



PINFISH

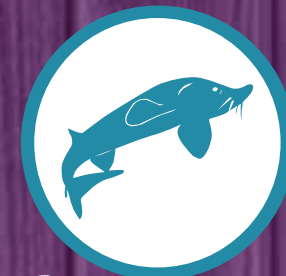


GOGGLE-EYE

# BAIT FISH

Some fish are raised to be bait for other fish. These include pinfish, goggle-eyes and shiners. Some people call pinfish "grouper candy." Cobia like to eat them also. Goggle-eyes are prized as bait because their amber color attracts many species. These fish are commonly found at bait and tackle stores and retail shops.

## FUN FACTS



STURGEON CAN WEIGH UP TO **1200 POUNDS.**

## OTHER FOOD FISH

REDFISH ARE CALLED **"RED DRUM"** BECAUSE THEY MAKE A DRUM-LIKE SOUND.



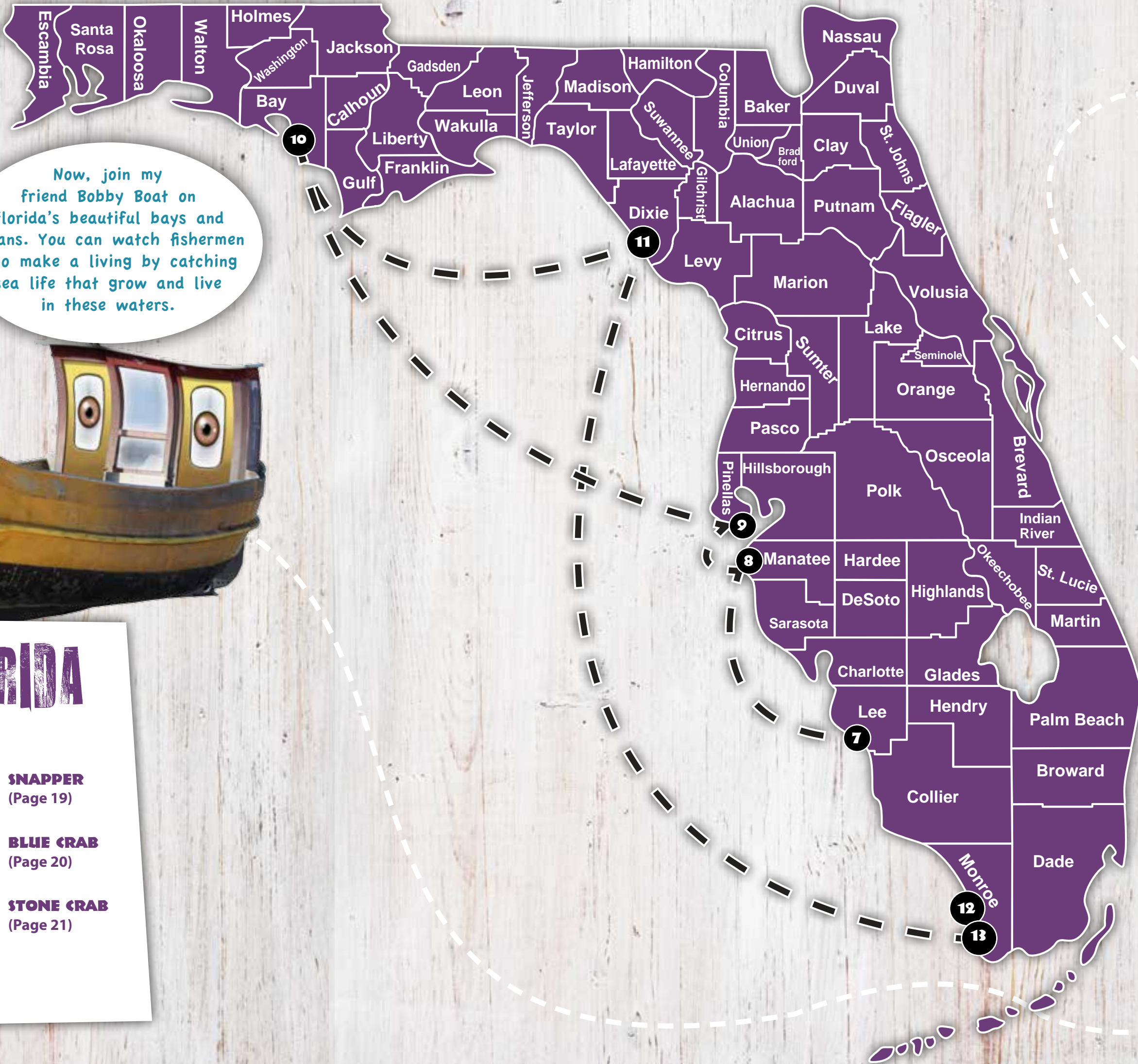
HYBRID STRIPED BASS, CATFISH, REDFISH, COBIA AND POMPANO ARE ALSO RAISED FOR FOOD.












Now, join my friend Bobby Boat on Florida's beautiful bays and oceans. You can watch fishermen who make a living by catching sea life that grow and live in these waters.

Hi kids, Let's go fishing!



# DRIVE THROUGH FLORIDA

## SEAFOOD

- 7  **SHRIMP**  
(Page 14-15)
- 8  **MULLET**  
(Page 16-17)
- 9  **GROUPE**  
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- 10  **SNAPPER**  
(Page 19)
- 11  **BLUE CRAB**  
(Page 20)
- 12  **STONE CRAB**  
(Page 21)
- 13  **SPINY LOBSTER**  
(Page 22-23)

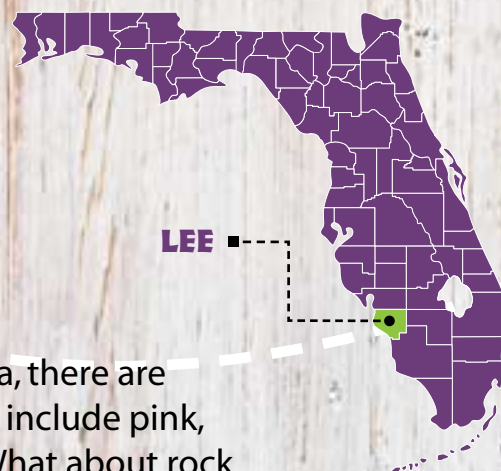


# SHRIMP

"Shrimp" is a word for being tiny or small. Florida shrimpers catch more than 10 million pounds of shrimp each year. That's a lot! It's the most popular seafood in the United States.



Let's travel to Lee County as commercial fishermen go shrimping. This seafood will be sold to seafood markets and grocery stores.



Shrimp are tasty crustaceans. In Florida, there are several different types of shrimp. They include pink, white, brown and royal red varieties. What about rock shrimp? They don't play the electric guitar! They get their name from their extra hard shell.



STEAMED ROCK SHRIMP



WHITE SHRIMP

WHITE SHRIMP



OUTRIGGERS

How do fishermen catch shrimp? They have specially designed boats with two long poles on both sides called "outriggers." Special shrimp nets hang from the outriggers into the ocean. As the boat moves along, the fishermen pull the nets up to catch the shrimp, allowing other marine life to escape.

Shrimp can also be raised in ponds or tanks for bait or as food for people. Native shrimp such as white shrimp are best suited as bait. Aquatic farmers must make sure there are enough minerals and oxygen in the water for the shrimp to thrive.

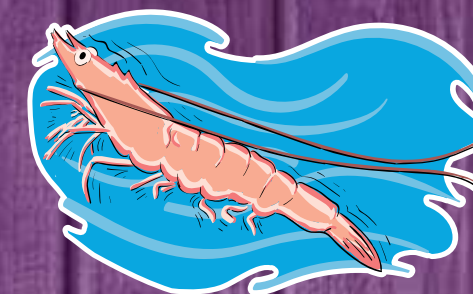


BROWN SHRIMP



SORTING PINK SHRIMP

## FUN FACTS



SHRIMP  
**SWIM**  
RATHER THAN CRAWL.



THEIR HARD SHELL  
IS CALLED AN  
**EXOSKELETON.**

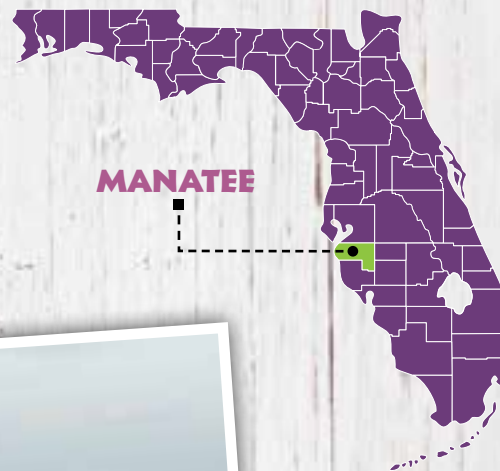
THEY CAN LIVE IN  
**FRESH,**  
**BRACKISH**  
AND **SALT** WATER.



Bob and Carol Cox, mbara.org

# MULLET

Mullet are fish that live in oceans, rivers or bays. They have excellent eyesight and swim fast in large groups called "schools." Mullet are hard to catch with a hook and line so fishermen use cast nets to bring them in.



The Anna Maria Islander

FISHING FOR  
MULLET



Now follow me to  
Manatee County where  
mullet are jumping!



Bob and Carol Cox, mbara.org

FISHING WITH A CAST NET



Douglas Gillespie

FRIED MULLET



Sam Wolf, tcpalm.com

JUMPING MULLET

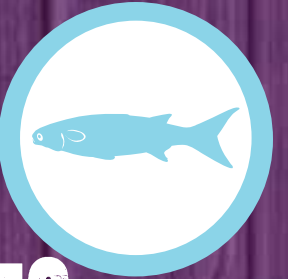
These fish like to jump but nobody knows exactly why. Maybe it is to warn the other fish that fishermen are coming. Many people think mullet are delicious to eat and worth the hard work to catch them. They can be eaten fried, broiled or smoked.



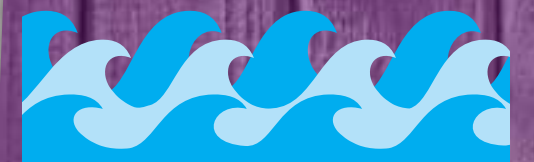
The Anna Maria Islander

MULLET  
FISHERMEN

## FUN FACTS



**MULLET**  
LIVE IN THE WARM  
FLORIDA WATERS  
AND OTHER  
SIMILAR PLACES.



FISHERMEN HAUL IN OVER  
**13 MILLION  
POUNDS**  
OF MULLET A YEAR.



BLACK MULLET AND  
SILVER MULLET ARE  
THE MOST POPULAR.

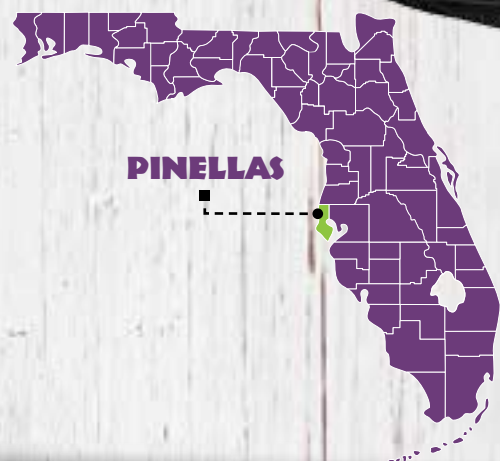




Bob and Carol Cox, mbara.org

# GROUPE

Grouper is a yummy fish, which is why people like to eat it. You can try grouper in a sandwich, a salad or just by itself. Fishermen catch millions of pounds of grouper each year with bait on a fishing hook. They use fish, shrimp and crab for bait.



GAG GROUPE



GROUPE FISHING

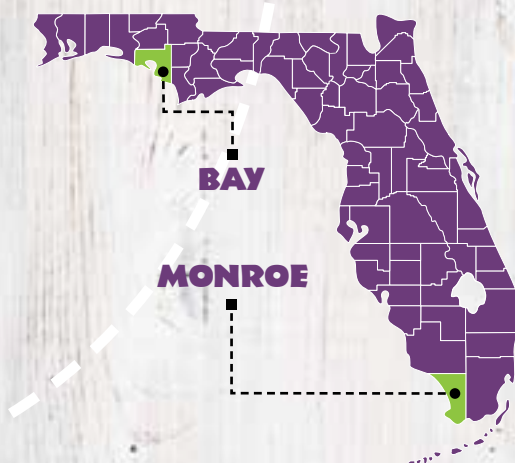


GROUPE AND CHEESE GRITS

There are over 400 types of grouper. Two of the most popular are red grouper and gag grouper. They both can live in the Gulf of Mexico or the Atlantic Ocean, but red grouper like deeper water of up to 1,000 feet. Should we dive in and look for some?

# SNAPPER

Bay County in Florida's Panhandle has lots of red snapper. Monroe County has yellowtail as well.



RED SNAPPER

Florida fishermen catch lots of red snapper and yellowtail snapper. Red snapper have bright rosy-red skin and irises. Many of them live in waters near Florida's Panhandle.

Do you see the racing stripe on the yellowtail snapper? It runs from nose to tail and looks cool!

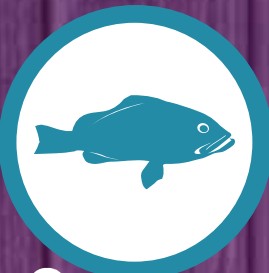
Yellowtails like to live near the southern tip of Florida.

Just like grouper, snapper are delicious, which is why fishermen must be careful not to overfish them. They can use hook and line gear, traps or spears but they cannot use nets. That would catch too many fish at one time. We don't want to run out!



YELLOW TAIL SNAPPER

## FUN FACTS



### GAG GROUPE

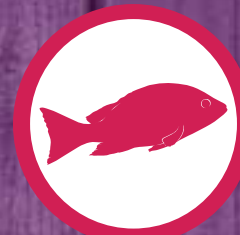
GROW UP TO 80 POUNDS, AND LIVE UP TO 16 YEARS.

### RED GROUPE

GROW UP TO 50 POUNDS, AND LIVE UP TO 30 YEARS.



GROUPE ARE SO POPULAR YOU CAN ONLY CATCH THEM DURING CERTAIN TIMES OF THE YEAR.



SNAPPER CONTAIN LOTS OF PROTEIN, VERY LITTLE FAT AND NO CARBOHYDRATES.

### YELLOWTAIL SNAPPER

GROW UP TO 11 POUNDS.

### RED SNAPPER

GROW UP TO 35 POUNDS.

THERE ARE APPROXIMATELY

105 SPECIES

OF SNAPPER IN THE WORLD.







# BLUE CRAB

Have you ever grown too big for your pants or shirt? Blue crabs do! When their shell gets too small they crawl out of it and within 24 hours a new, bigger shell forms over their soft body. This is called "molting." When their shell is older and hard, we say they are hard shell crabs. The ones with the new softer shell are called soft shell crabs and you can eat the entire crab, shell and all.

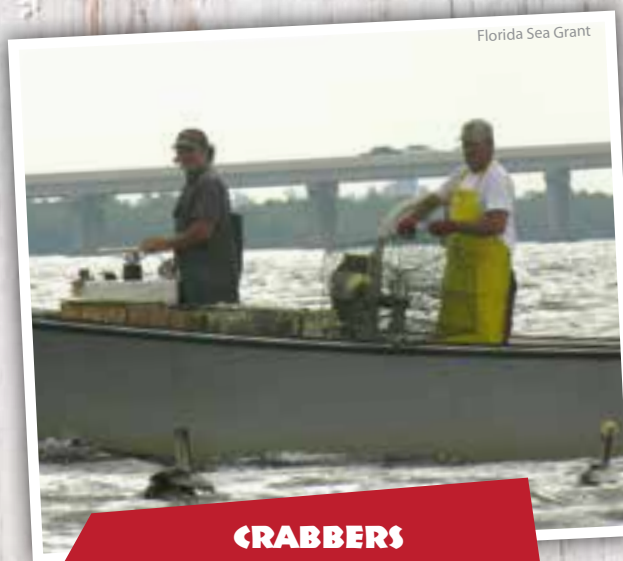


HARD SHELL  
BLUE CRAB



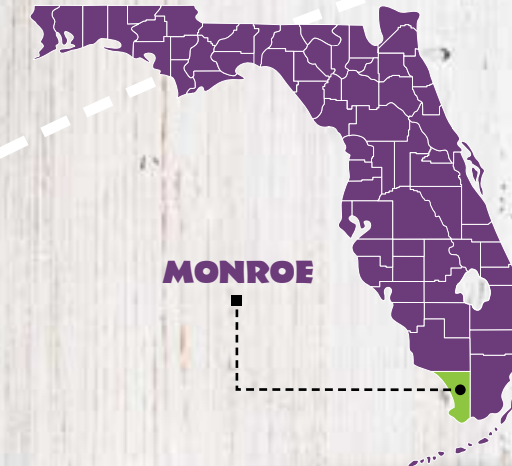
Blue crab get their name from the blue color of their shell. They have two pincer claws and four pairs of bright blue legs. Females have red tips on their legs which look like painted fingernails. Blue crab can live in colder water than other types of crab.

Fishermen use metal traps to catch them but they only haul in some of their catch. They let the little crabs go so there will be some for next year.



CRABBERS

# STONE CRAB



MONROE



STONE CRAB

Stone crab are a unique kind of seafood. Only the claws are eaten and they are yummy! Fishermen can harvest one of the claws from the stone crab, and then the crab will grow another one back! It takes about a year, but it keeps more stone crab in the ocean. Their larger claw is called a "crusher claw." It does just that - crushes the crab's prey. The smaller claw is the pincer claw. Stone crab are caught in wooden traps in the Atlantic Ocean and the Gulf of Mexico. Some fishermen put out up to 100 traps at one time. That's a lot of traps to check each day.



WOODEN CRAB  
TRAP



STONE CRAB  
CLAWS

# FUN FACTS



FISHERMEN CATCH OVER  
**6 MILLION**  
POUNDS OF  
**BLUE CRABS**  
EACH YEAR.

A STRING AND  
A SMELLY FISH  
CAN BE USED  
TO CATCH BLUE  
CRABS.

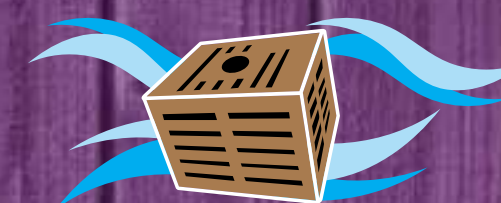


THEY ABSORB LOTS OF WATER  
TO CRACK THEIR SHELL WHEN  
IT IS TIME TO MOLT. THIS  
HAPPENS ABOUT 20 TIMES  
DURING THEIR LIVES.



ABOUT  
**98%**  
OF ALL  
**STONE CRAB**  
COMES FROM  
FLORIDA.

FISHERMEN USE CHICKEN NECKS,  
PIG'S FEET AND FISH HEADS TO  
BAIT CRAB TRAPS.





# SPINY LOBSTER

Let's stay in Monroe County to learn about spiny lobster.

Spiny lobster look a little like a monster! They have long antennae, teeth that crush prey, 10 legs and horns over their eyes. But, they are a delicious monster and people love to eat them.

MONROE

PREPARED LOBSTER TAILS

They crawl and hide under rocks on the bottom of the ocean and Gulf in the warm waters of South Florida and the Keys. Fishermen catch them with their hands and in wood or plastic traps.

BABY SPINY LOBSTER

LOADING LOBSTER TRAPS

You can only catch them when they are large enough, during certain times of the year. About six million spiny lobster are harvested every year!

A FULL LOBSTER TRAP

COMMERCIAL LOBSTER BOAT

## FUN FACTS



### SPINY LOBSTER

LIVE IN THE CARIBBEAN SEA, THE ATLANTIC OCEAN AND THE GULF OF MEXICO.



THEY ARE COUSINS TO SHRIMP, CRABS AND CRAYFISH, AND ARE REFERRED TO AS "BUGS."



SPINY LOBSTER HUNT AT NIGHT.

FEMALE LOBSTER CARRY THEIR BRIGHT ORANGE-COLORED BABIES ON THEIR UNDERBELLIES.





# LAND HO!

We're heading to shore because our tour is complete. But we hope you will ask for Florida seafood at restaurants and grocery

stores, tropical fish and plants at pet stores or maybe even an alligator purse in the mall. Then, remember the men and women

who farm aquaculture products or make their living from our bays and oceans. Good bye!



# DEFINITIONS

**ANTENNA:** A long, thin sensitive organ on the head of an insect, crab or lobster that is used to feel and touch things.

**AQUATIC:** Living or growing in the water.

**BRACKISH:** A mixture of fresh water and salt water.

**CAVIAR:** The eggs of a large fish (such as the sturgeon) that are salted and eaten as food.

**CRUSTACEAN:** A type of animal that has several pairs of legs and a body made up of sections that are covered in a hard outer shell. Crabs, shrimp and lobsters are crustaceans.

**EXTINCT:** A species of animals that no longer exists.

**FILTER:** To move something, such as a gas or liquid, in order to remove something unwanted.

**IRIS:** The colored part of an eye.

**MARINE:** Relating to the sea or the plants and animals that live in the sea.

**NATIVE:** The place or type of place where a plant or animal naturally lives.

**NUTRIENT:** A substance that plants, animals or people need to live and grow.

**OVERFISH:** To catch too many fish so that there are not enough remaining.

**PINCHER:** A type of claw that holds objects.

**PREDATOR:** An animal that lives by killing and eating other animals.

**REPTILE:** An animal that has cold blood, lays eggs, and has a body covered with scales or hard parts. Snakes, lizards, turtles and alligators are reptiles.

**SHELLFISH:** An animal (such as a crab or an oyster) that has a hard outer shell and lives in water.





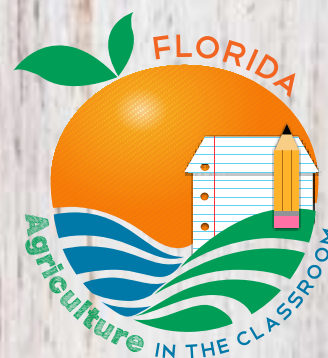


**Florida Department of  
Agriculture and Consumer Services**

Commissioner Adam H. Putnam



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