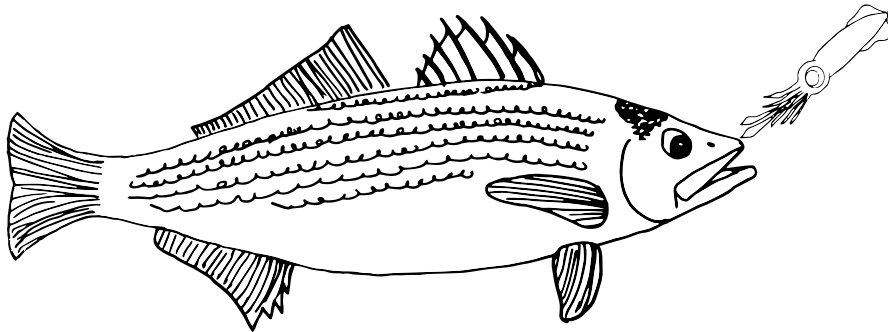


COLOR and Learn all about Fish!

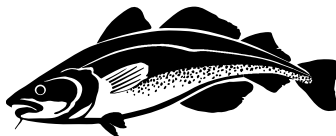
Get to know your Massachusetts saltwater sport fish!



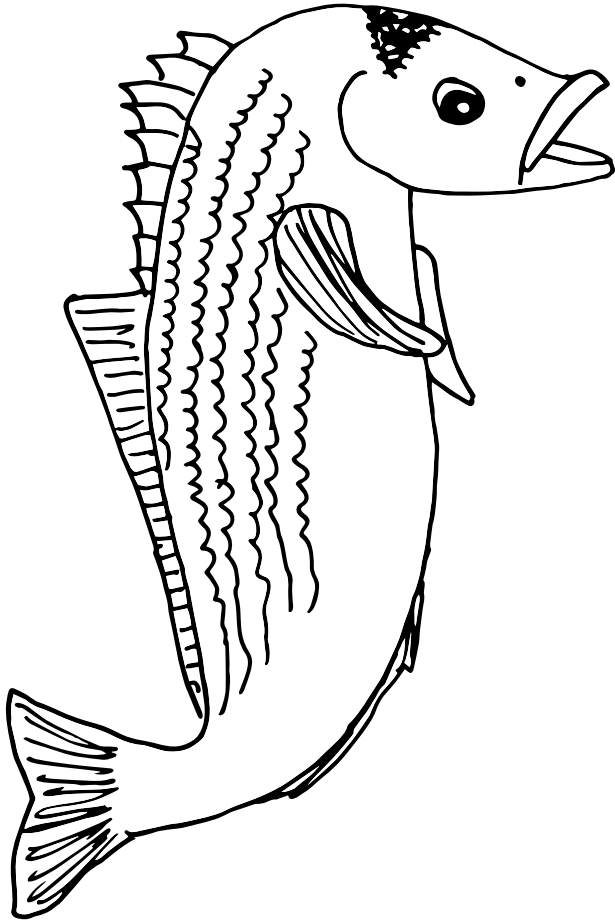
This book belongs to: _____



Marine Fisheries
Commonwealth of Massachusetts



What is a fish?



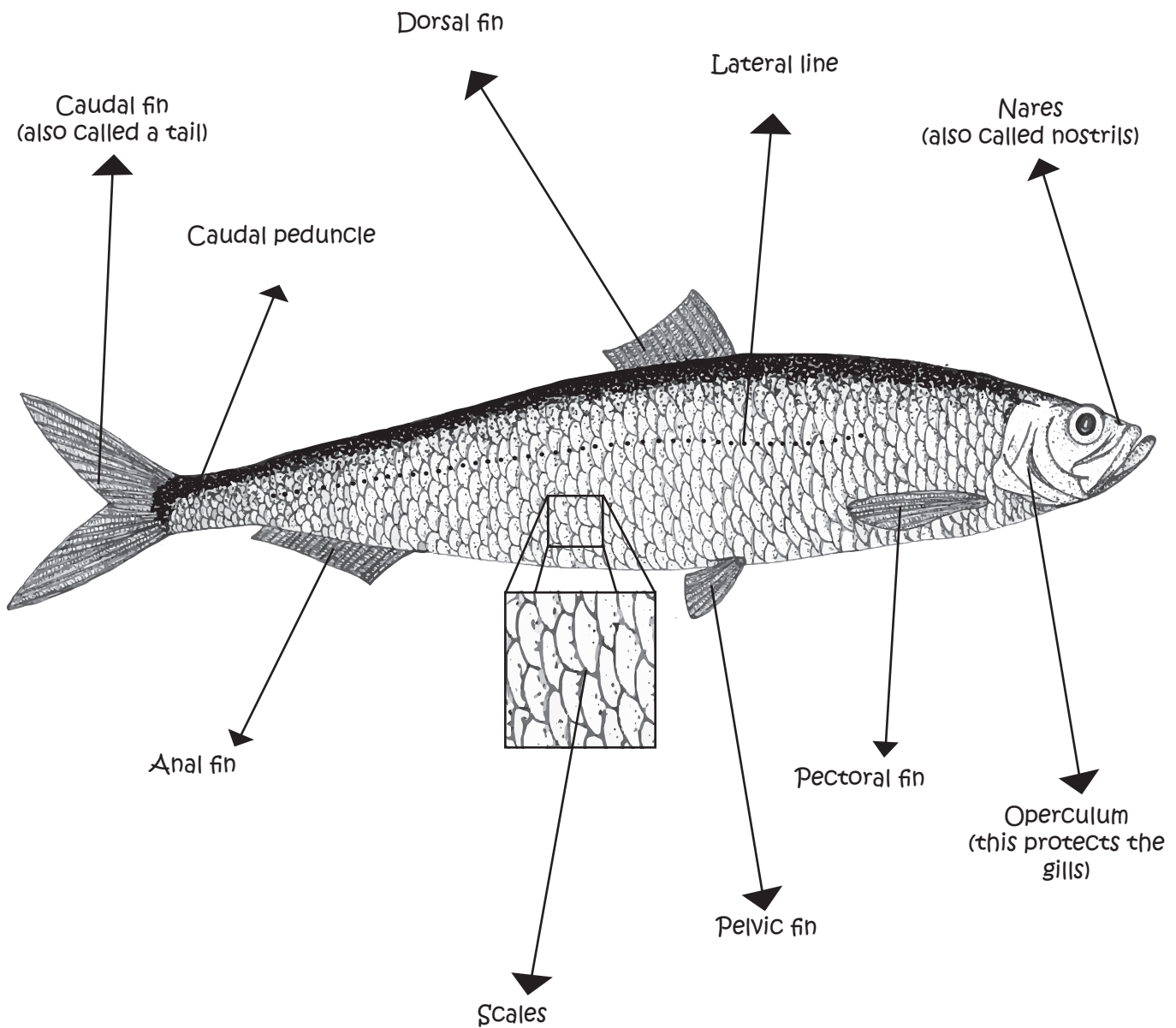
Fish are a kind of **animal**. They use gills to breathe, live in water, and have no digits (like fingers and toes) on their limbs! Most fish are cold-blooded, or **ectothermic** and rely on the water around them to keep them a good temperature. Some fish live in one area their entire lives while others migrate from one area to another.

There are over 32,000 **species** of fish ranging from living in high mountain lakes to the deepest spots in the ocean. Different fish can live in freshwater, saltwater, or **brackish** water. There are many fish that live along the Massachusetts coastline. Here, we'll learn about and meet some of the species that we like to fish for fun! These fish belong to the group 'bony fish.'



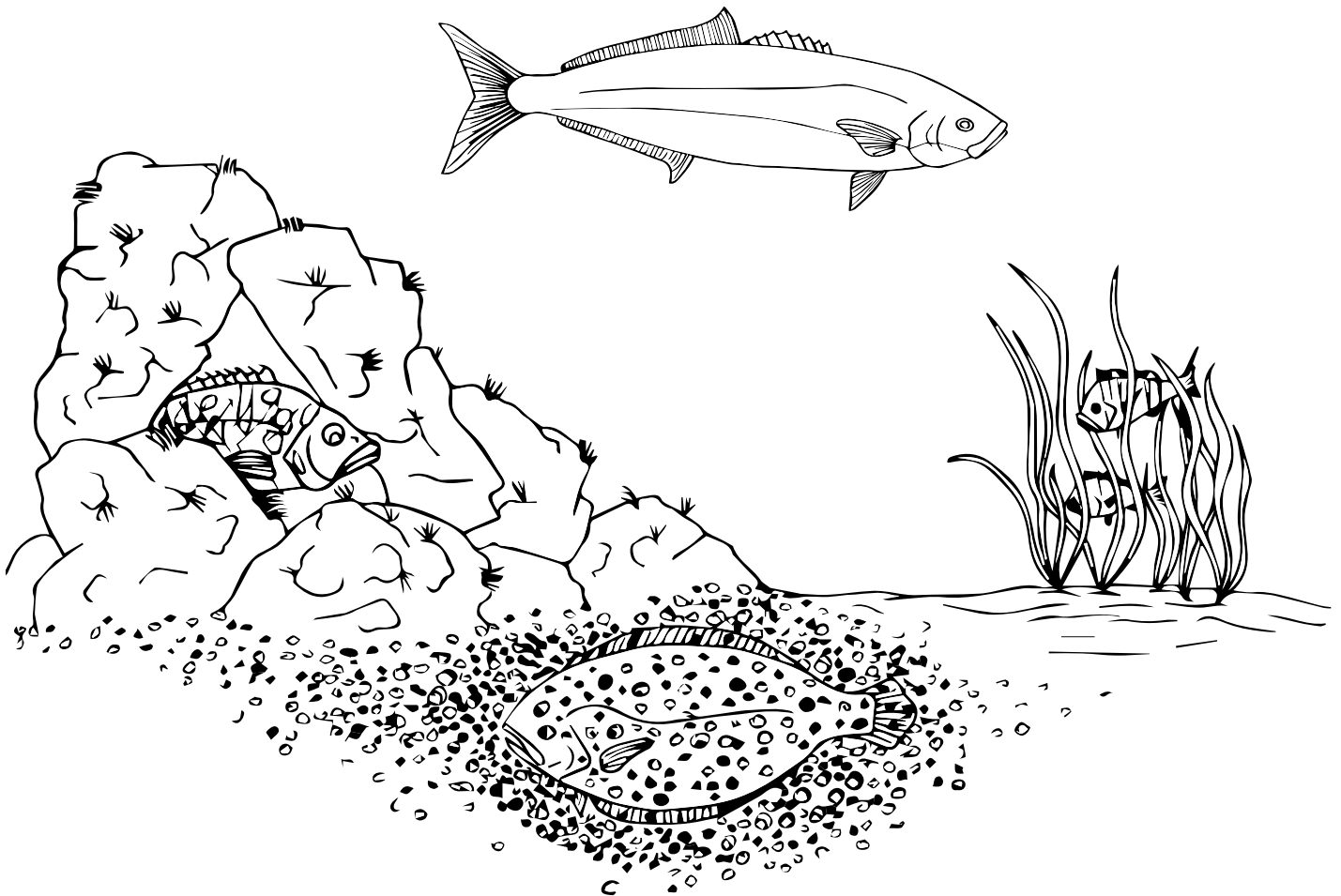
What are the parts of a fish?

Fish have many body parts just like you and me! Some of the body parts you will see on most fish, besides eyes and a mouth, are **scales**, fins, and **opercula** (plural for operculum)!



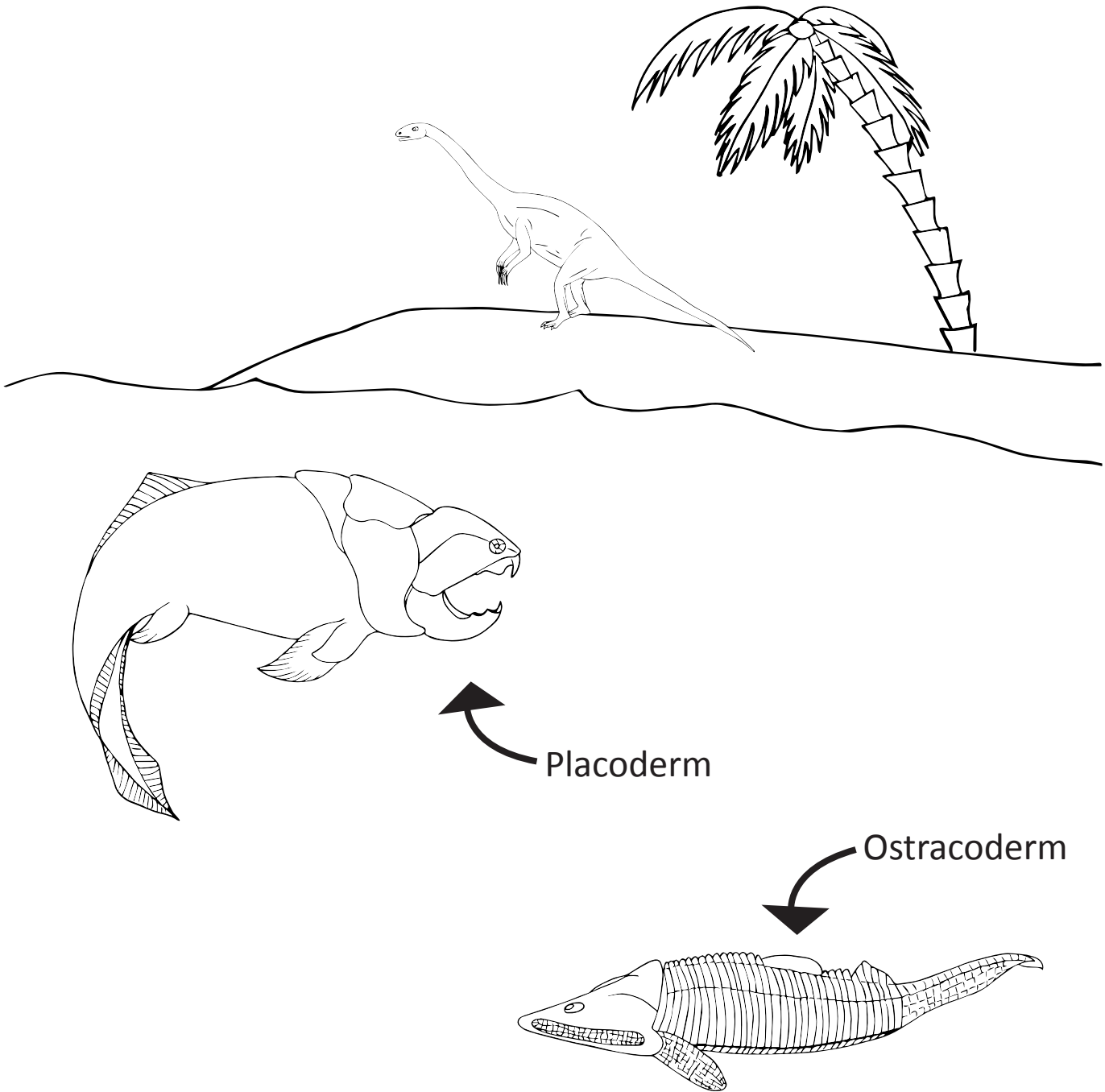
Where are the fish?

Each fish below has special colors and markings to help them hide. Can you see the different patterns on each fish that help them hide?



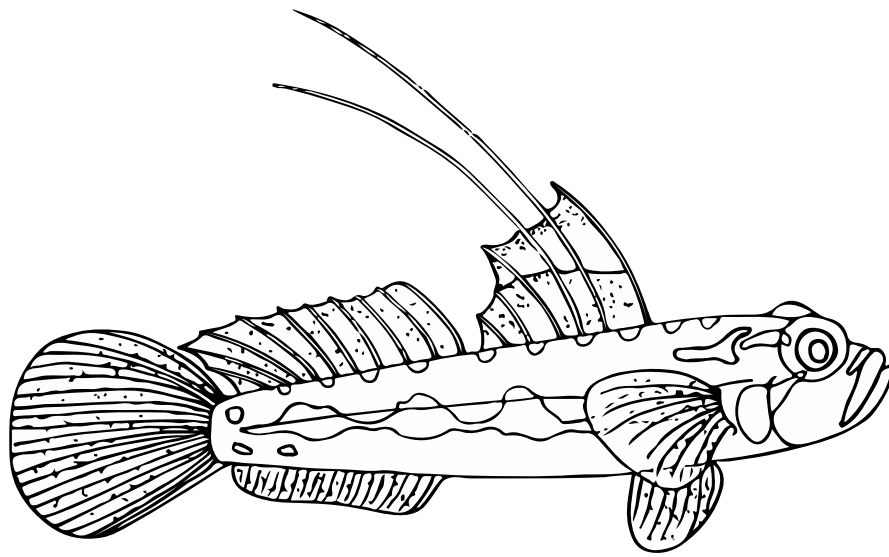
Although fish generally look the same, some have special shapes or markings that help them survive! Many fish have countershading. This is when fish are dark on the top and light on the belly. When seen from above, the fish looks like the dark waters below. When seen from below, the fish looks like the bright, sun lit waters above. This is a form of **camouflage**.

How long have fish existed?



Fish are among the oldest **vertebrates** on Earth. **Jawless fish** called ostracoderms existed 510 million years ago! The first jawed fish called **placoderms** appeared 416 million years ago. Dinosaurs showed up around 230 million years ago and only lived until 65 million years ago. These early fishes outlived the dinosaurs and were around until 2.5 million years ago!

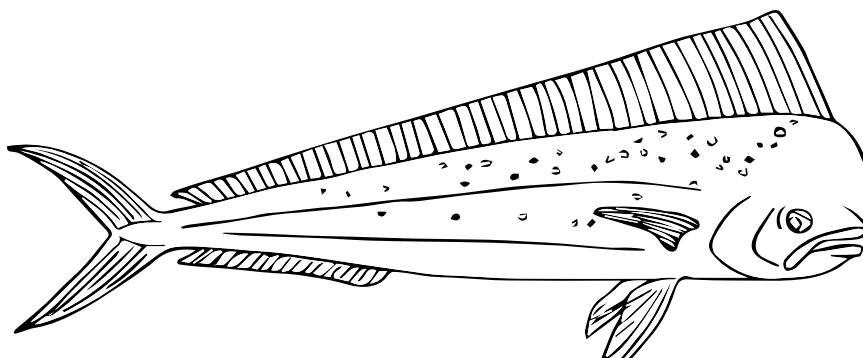
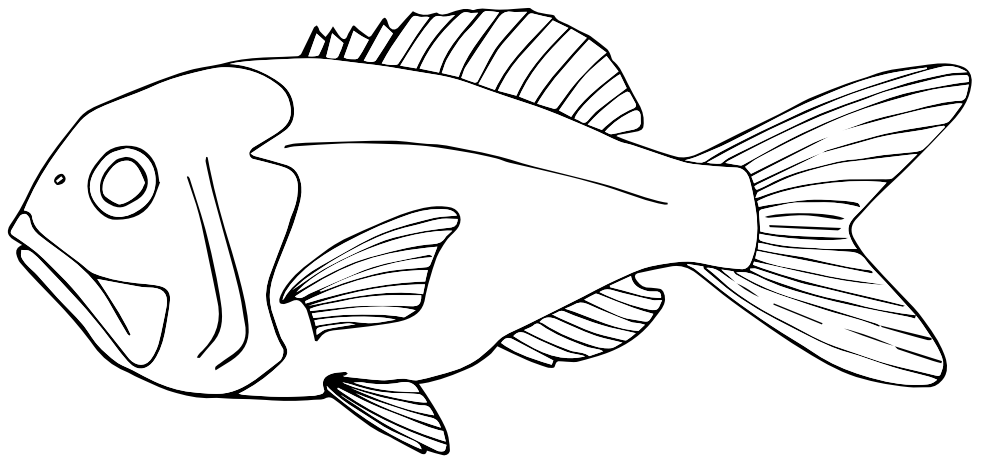
How old do fish get?



Pygmy goby



Orange roughy

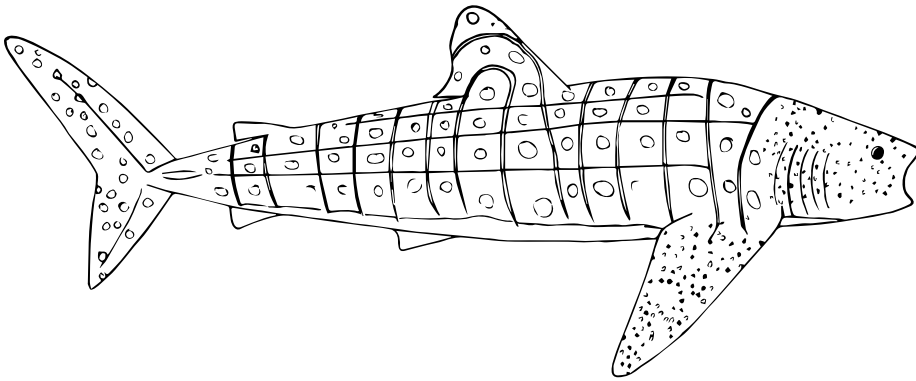


Mahi mahi



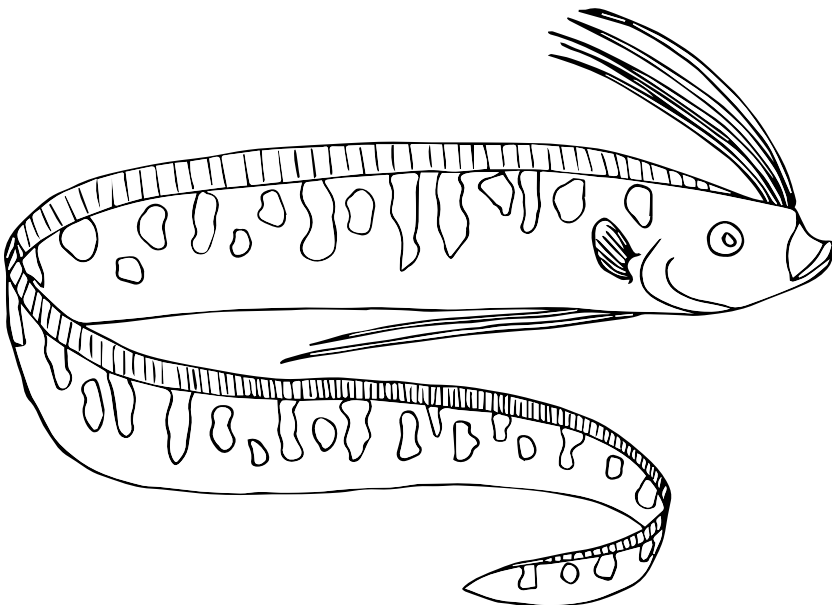
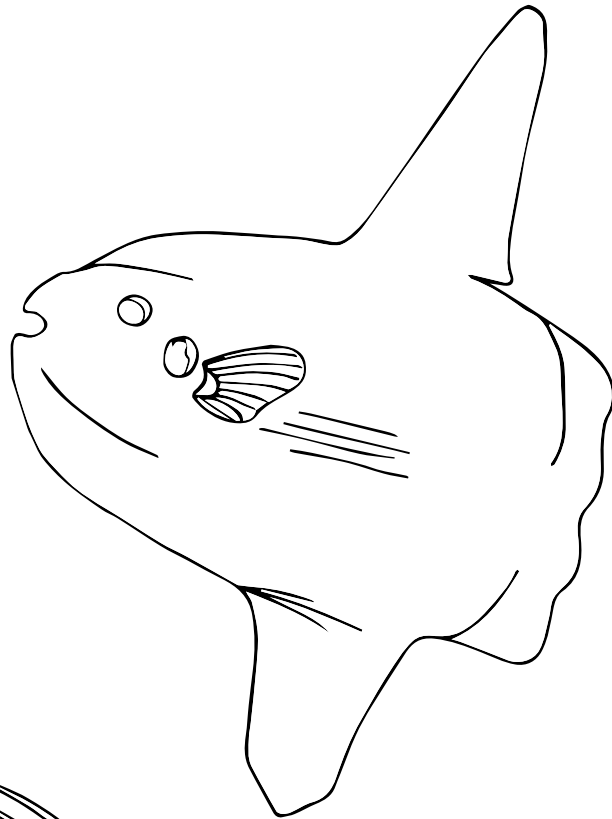
Fish range in life spans. The youngest living fish, the **Pygmy Goby**, lives only to 59 days! **Mahi mahi**—common dolphinfish—live to only 4 or 5 years, while orange roughy has been known to live for 150 years. Some koi have been reported to live over 200 years!

How big do fish get?



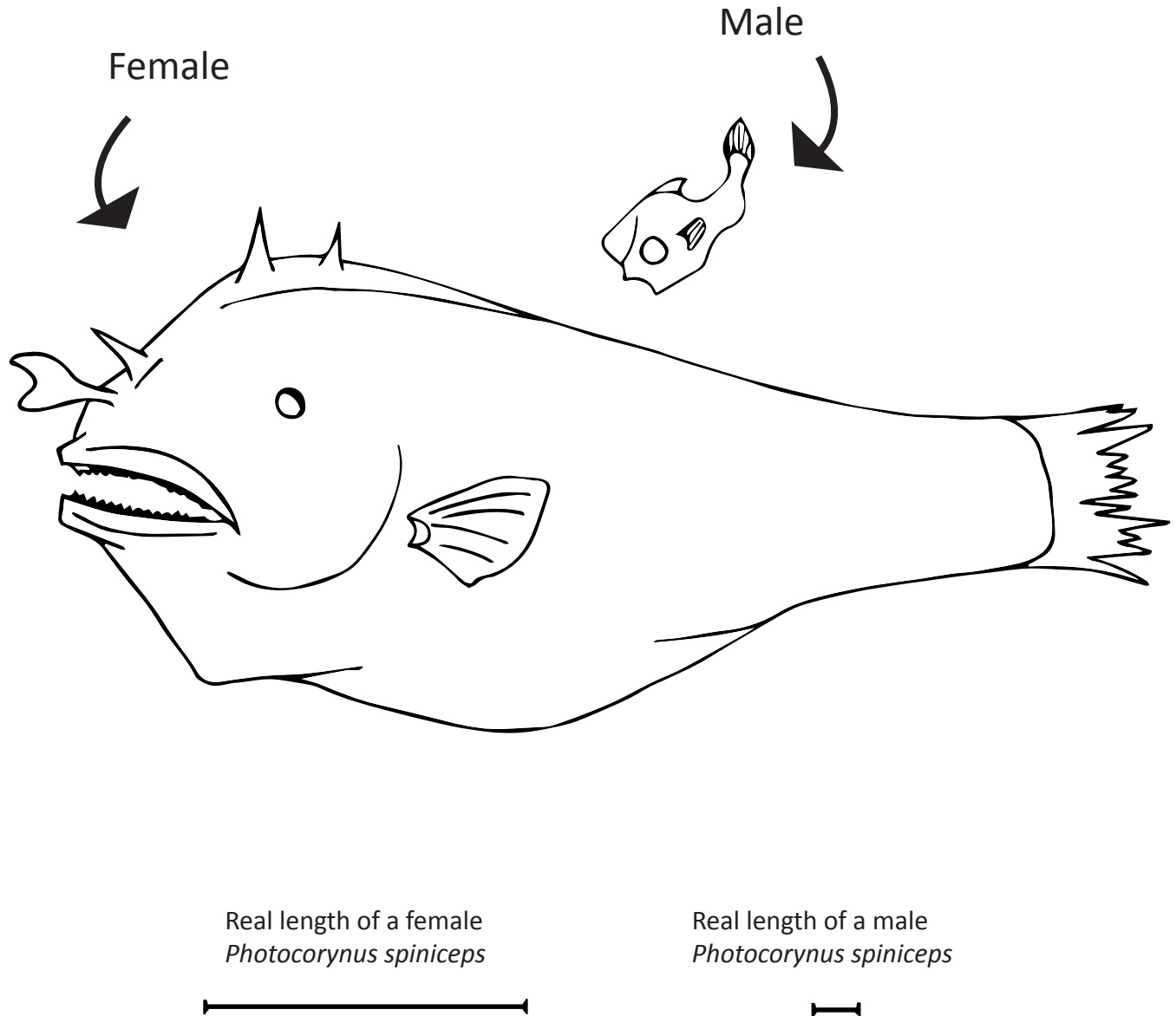
The largest fish of any kind is the whale shark. Whale sharks can grow to 50 feet long and weigh over 47,000 pounds!

The largest bony fish is the ocean sunfish. Ocean sunfish can grow to 11 feet long and weigh over 5,000 pounds! They are easily recognized by their odd body shape.



The **giant oarfish** is the longest bony fish in the world. It is a very thin and long fish that can be over 55 feet long and weigh over 650 pounds!

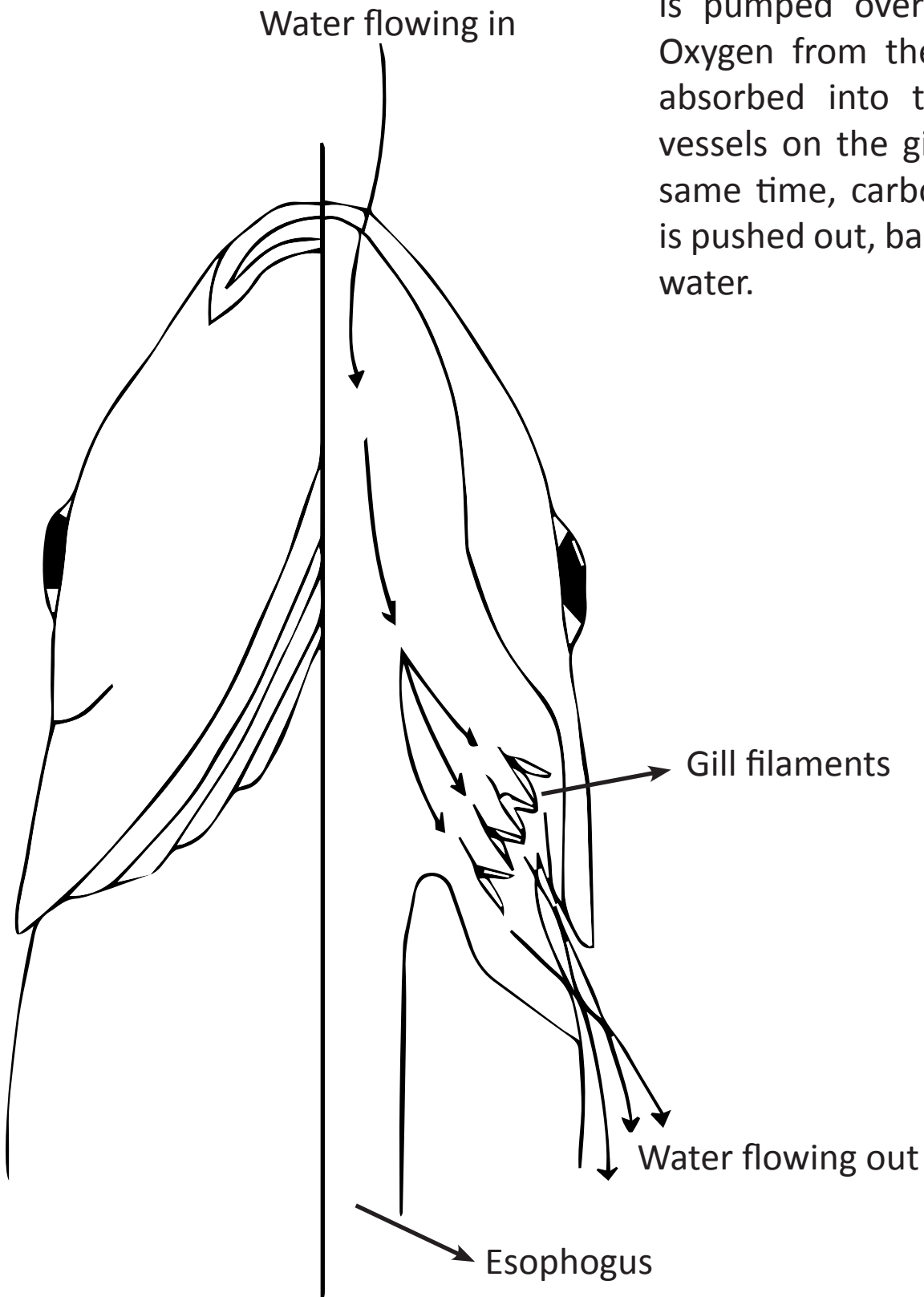
What is the smallest fish?



There are many small fish, but the male anglerfish in the species *Photocorynus spiniceps* is the smallest known fish when fully grown. It is only 0.25-0.3 inches when an adult! The females, on the other hand, grow much bigger—to almost 2 inches! These and some other angler species live in deep water—over 4,000 feet deep!

How do fish breathe?

Instead of lungs, most fish use **gills** to breathe. Water is pumped over the gills. Oxygen from the water is absorbed into thin blood vessels on the gills. At the same time, carbon dioxide is pushed out, back into the water.



Do fish sleep?

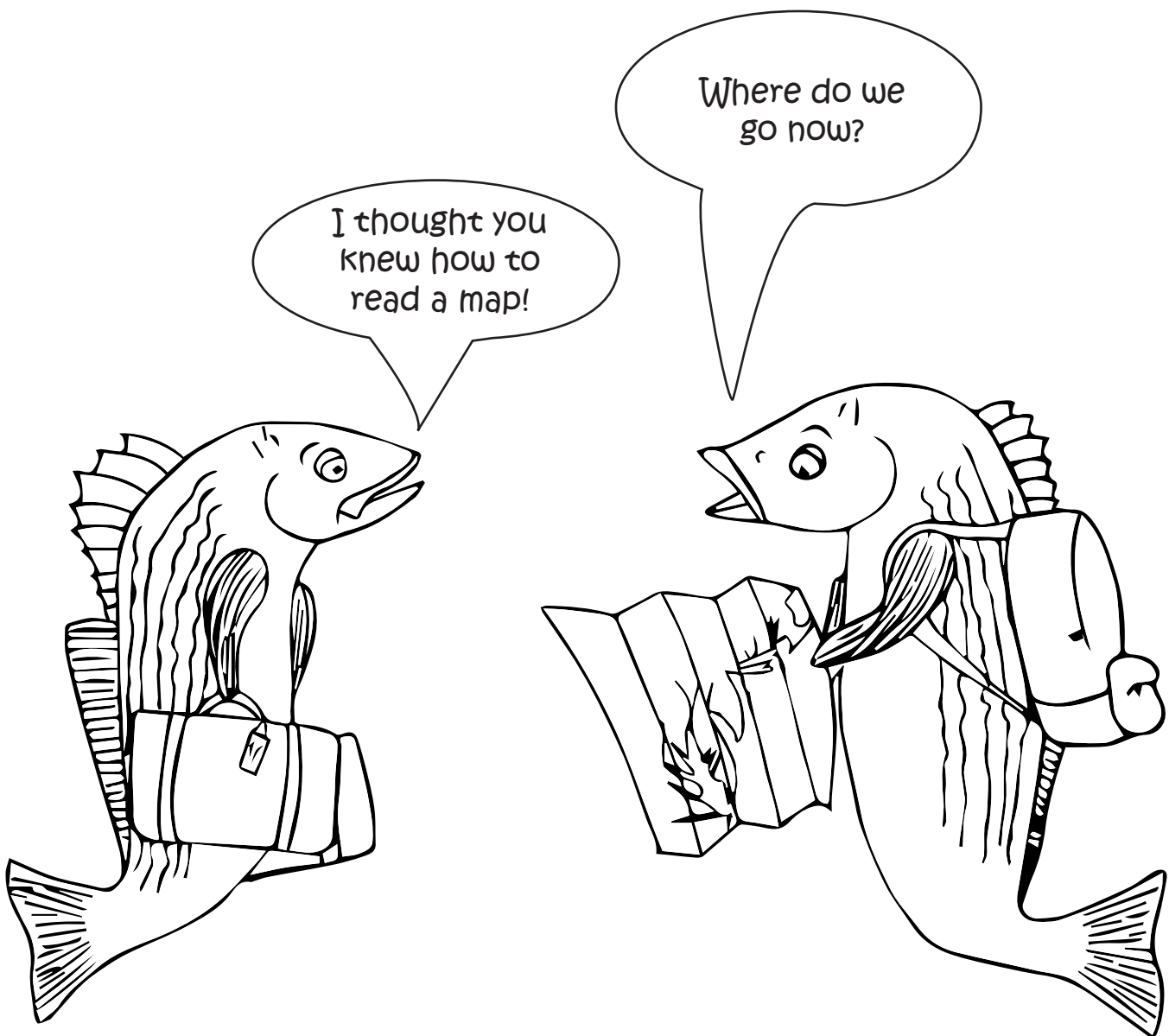
All fish rest, but fish don't close their eyes and go to sleep like we do, they don't have any eyelids! Many fish find a place to hide so they can relax! Some fish find a hole to settle down and hide in to rest. Other fish relax and hide by burying themselves in the ground. Fish that swim constantly rest by daydreaming as they swim along. Fish are never fully asleep because they need to make sure they stay safe from predators!

Sand lance relax by burying themselves in the sand at night.



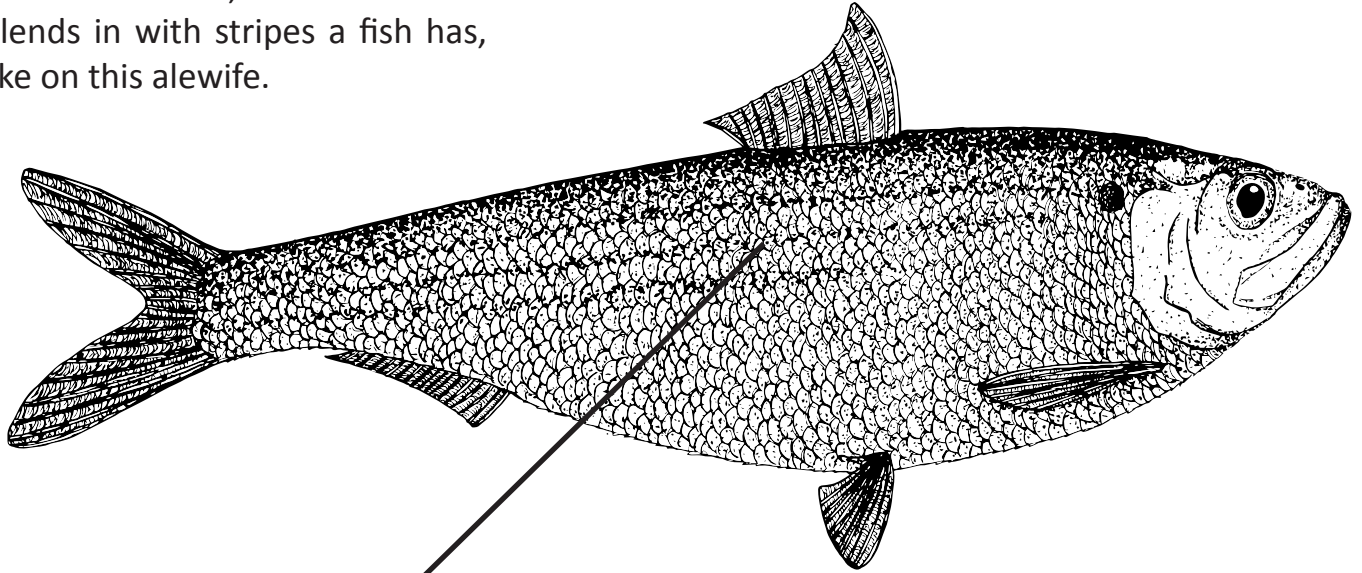
Where do fish go in the winter?

While some fish remain in the same place throughout their lives, others **migrate** to different areas. Some fish, like striped bass, move to freshwater to breed. Other fish, like bluefish, live off the coast of more southern states—South Carolina to Florida—in the winter and move north to Massachusetts in the summer. Some fish, like tuna, can travel across the Atlantic to Europe and back!



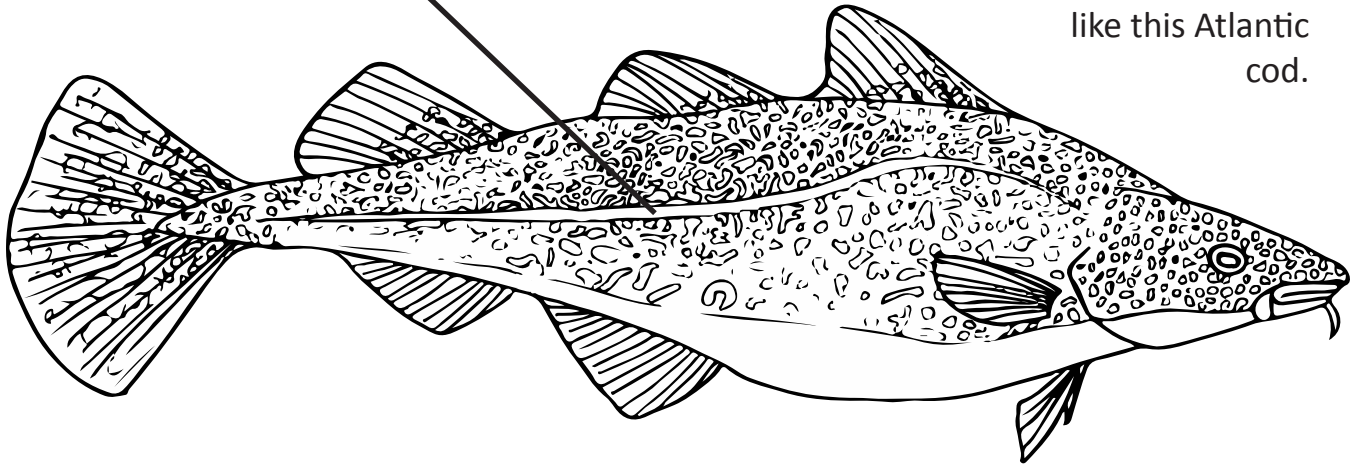
What is a lateral line?

The lateral line can be seen as a distinct line on both sides of most fish. Sometimes, the lateral line blends in with stripes a fish has, like on this alewife.



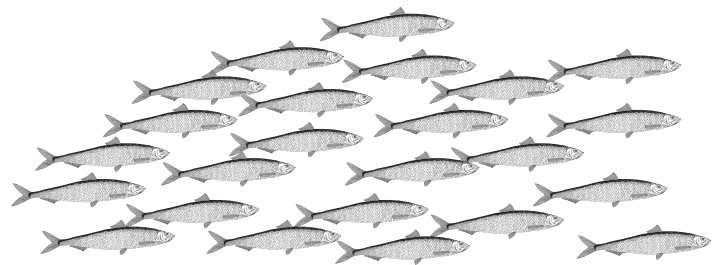
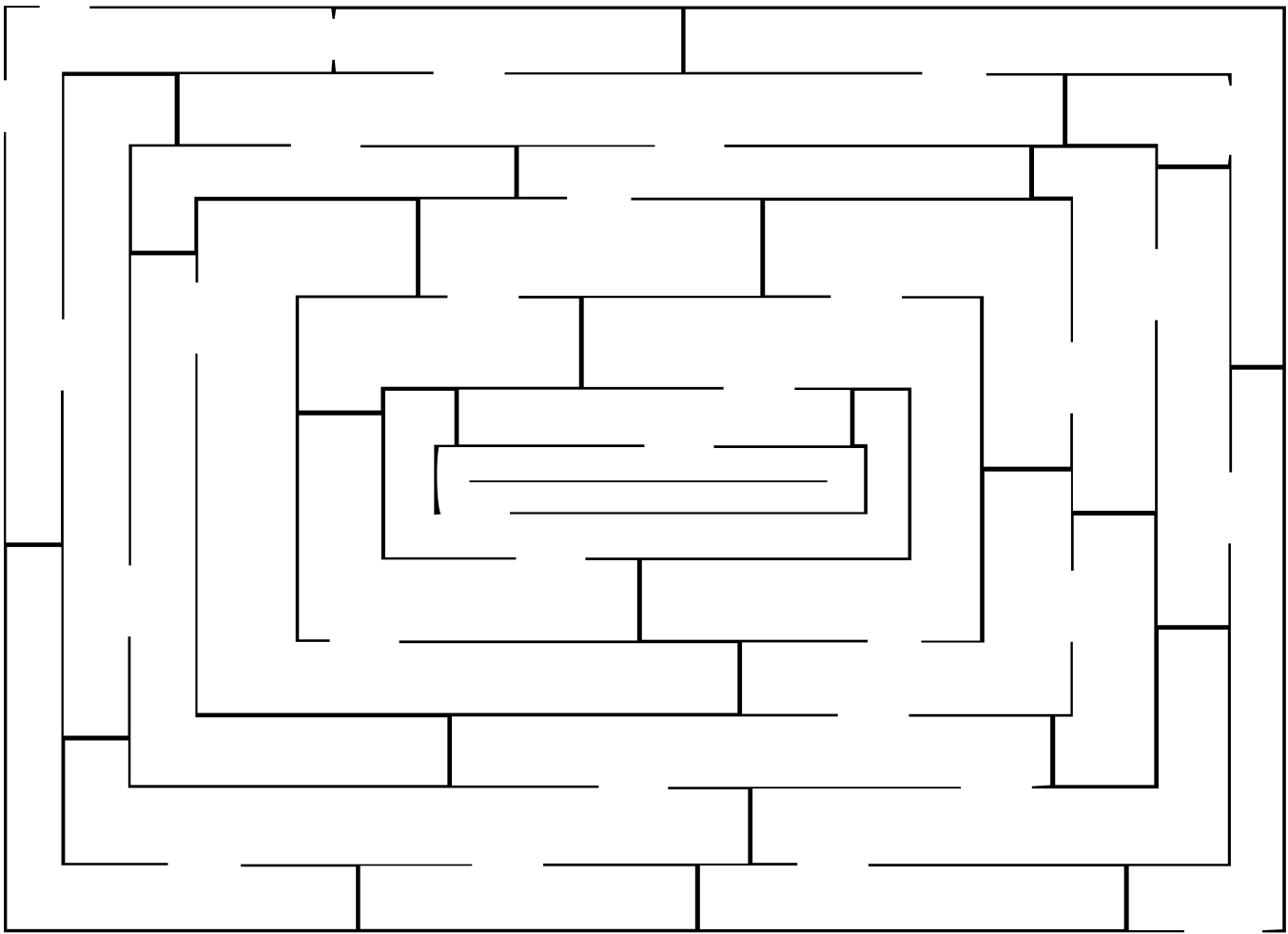
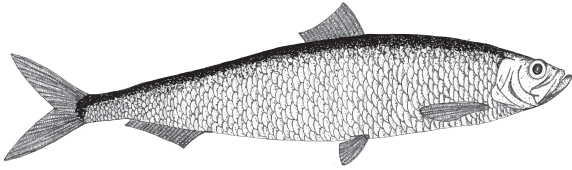
Lateral line

It's hard to miss the lateral line on fish like this Atlantic cod.



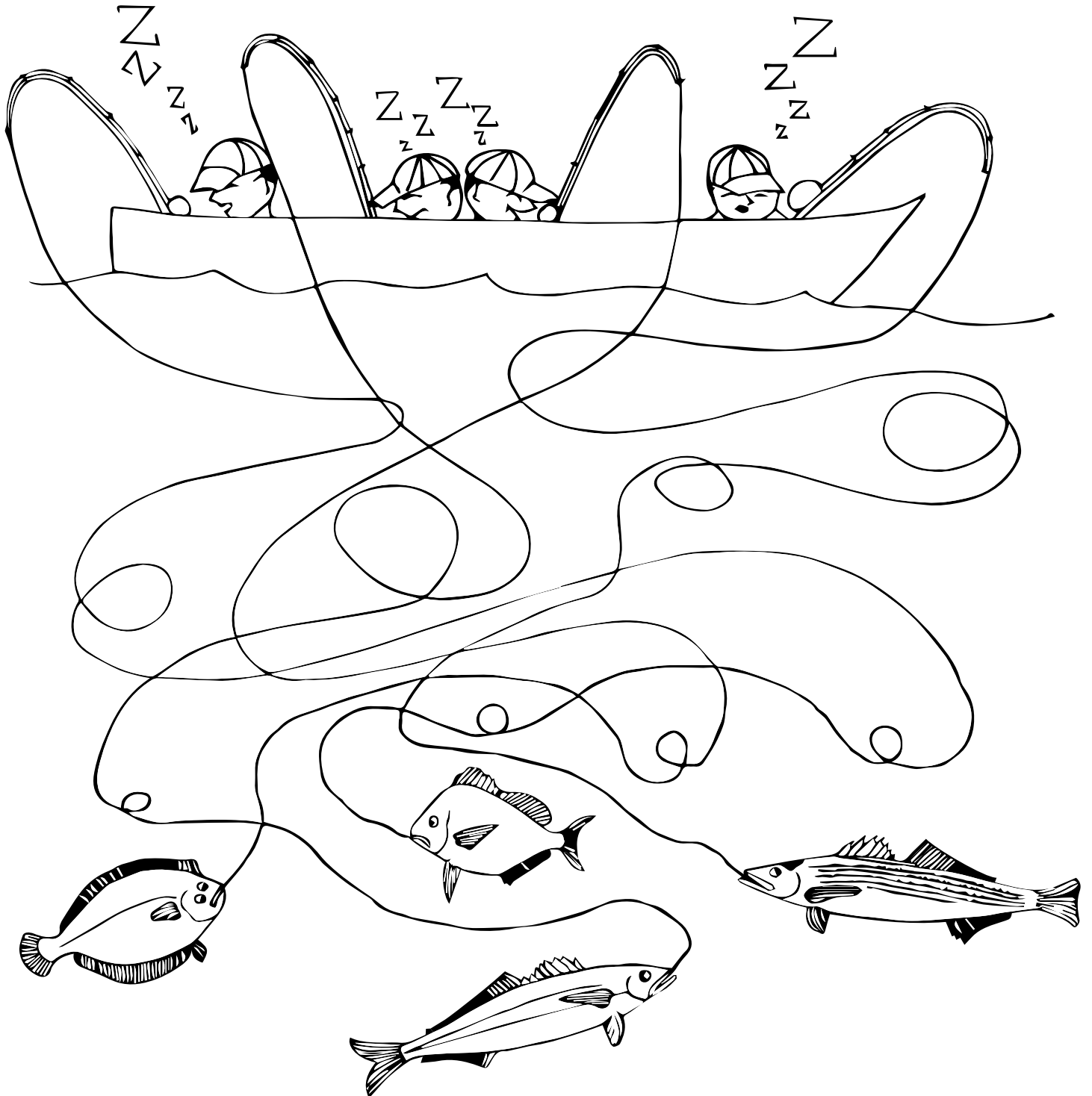
Many **pelagic** fish school, or move together, in large groups. They can swim very close and move in the same direction because of their **lateral lines**. A lateral line is a line of pores on both sides of the fish that senses pressure changes (movement) in the water. This lets the fish feel when others are moving before seeing them move! Lateral lines also help fish 'feel' when a predator or prey is around!

Help the Atlantic herring find its way back to the school!



Who has which fish?

All of the anglers on this boat fell asleep! Help them untangle their lines and see who caught which fish!



Can you find all of the hidden fish names?

Look up, down, diagonally, and backwards!

A	R	W	D	Q	P	L	M	D	Y	B	D	V	Y	L	N	N
T	D	E	W	I	N	T	E	R	F	L	O	U	N	D	E	R
L	O	W	D	S	S	A	B	A	E	S	K	C	A	L	B	L
A	C	Y	Y	N	N	P	L	X	X	S	Z	R	V	N	S	J
N	C	J	Z	P	U	D	O	P	Y	X	C	V	M	S	L	N
T	I	Q	Y	R	U	O	T	L	L	Q	X	U	A	M	L	V
I	T	D	L	N	E	C	L	R	L	J	N	B	L	N	K	T
C	N	B	K	Y	M	N	S	F	W	O	D	Z	Y	P	A	L
M	A	T	B	R	G	N	N	V	R	E	C	W	Y	U	I	N
A	L	P	L	M	D	R	G	U	P	E	J	K	T	J	N	N
C	T	R	U	Y	D	Z	L	I	C	Q	M	O	J	P	D	J
K	A	B	E	Z	L	V	R	M	L	M	G	M	M	M	J	N
E	W	Z	F	Q	D	T	L	L	M	B	D	T	U	Q	Y	R
R	D	V	I	X	S	Z	K	B	R	R	D	D	T	S	T	Y
E	X	B	S	R	B	Y	Y	R	D	V	Q	K	V	M	T	N
L	N	N	H	J	N	R	D	M	V	R	L	M	R	R	N	M

Atlantic Cod

Black Sea Bass

Cunner

Sculpin

Striped Bass

Tautog

Atlantic Mackerel

Bluefish

Pollock

Scup

Summer Flounder

Winter Flounder