U.S. Fish & Wildlife Service

The Pacific Lamprey Experience

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Words To Know

Ammocoete - (am-o-seat): Larval stage of the lamprey life cycle. The stage of the lamprey's life cycle that follows the hatching of eggs.

Anadromous - (a-nad-ro-mus): Fish that hatch and rear in fresh water, migrate to the ocean (salt water) to grow and mature, and migrate back to fresh water to spawn and reproduce.

Anticoagulant - (an-ti-co-ag-u-lant): A substance that hinders the clotting of blood.

Cartilage - (kahrt-l-ig): A tough, elastic, fibrous connective tissue found in various parts of the body, such as the joints and outer ear.

Macropthalmia - (ma-crop-thal-mi-uh): The stage of the Pacific lamprey's life cycle during which migration to the ocean occurs.

Metamorphosis - (met-uh-mor-fuh-sis): The rapid transformation from the larval to the adult form that occurs in the life cycle of many animals similar to changing from a tadpole to a frog, or from a caterpillar to a butterfly.

Parasite - (par-uh-site): An animal or plant that lives in or on a host (another animal or plant); it obtains nourishment from the host without benefiting the host.

Words To Know (cont.)

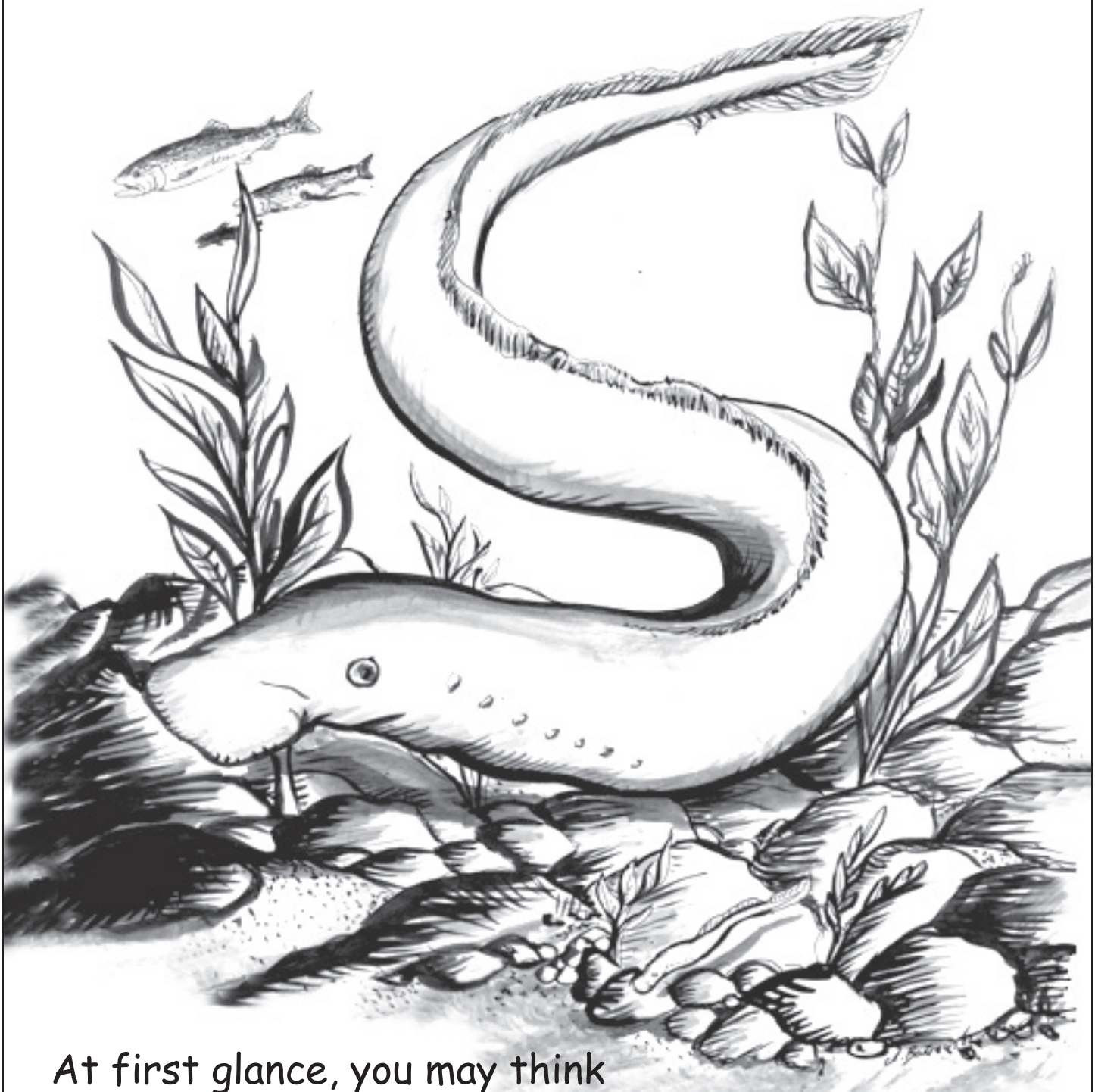
Predator - (pred-uh-tuhr): An animal that eats other animals

Prey - (pray): An animal that is eaten by other animals

Smolt - (smOlt): A juvenile anadromous fish that has undergone physical changes to prepare for life in salt water.

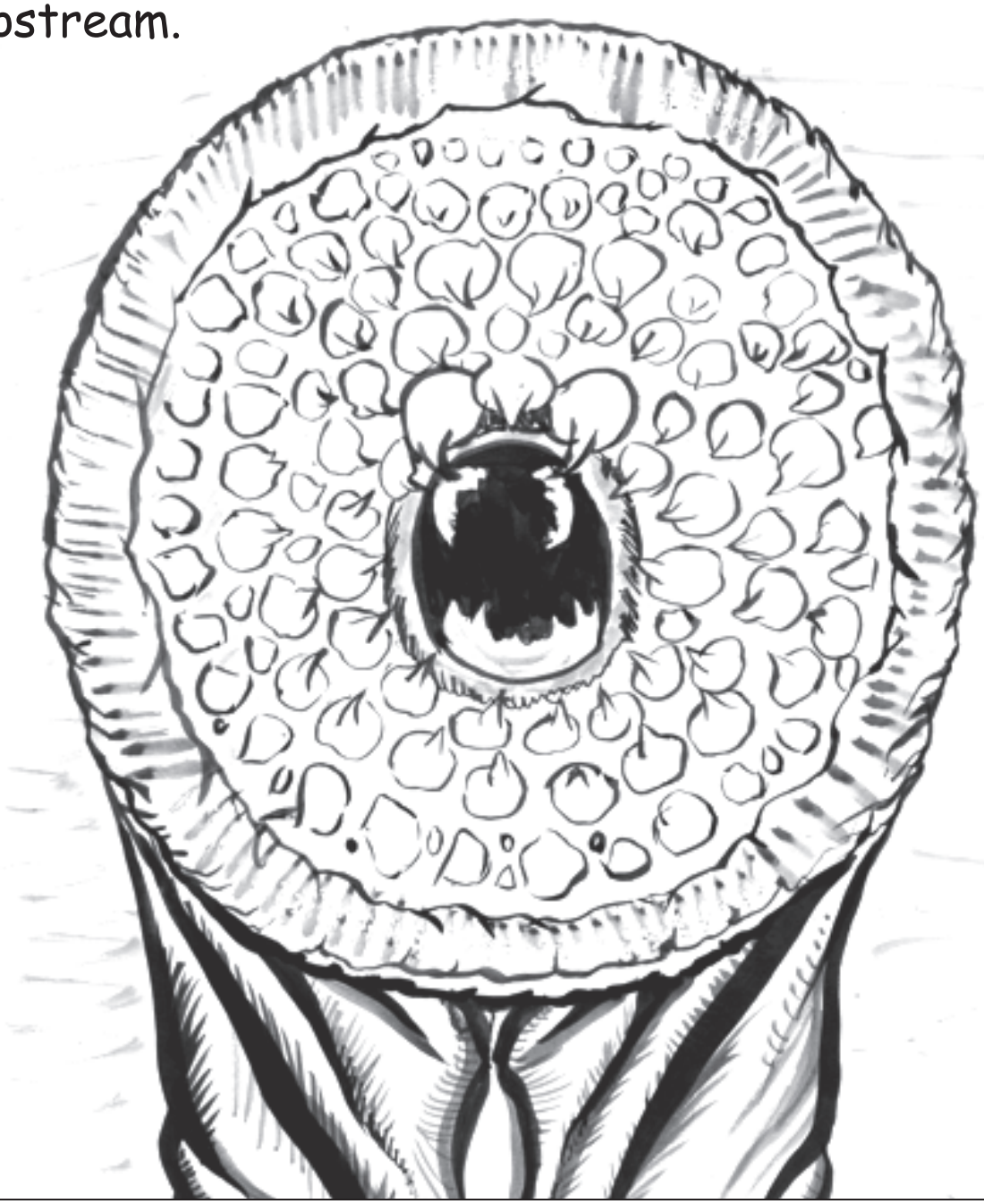
Spawn - (spawn): The act of reproduction of fishes. The mixing of the sperm of a male fish and the eggs of a female fish.

Species - (spee-seez): A group of organisms that are capable of reproducing fertile offspring

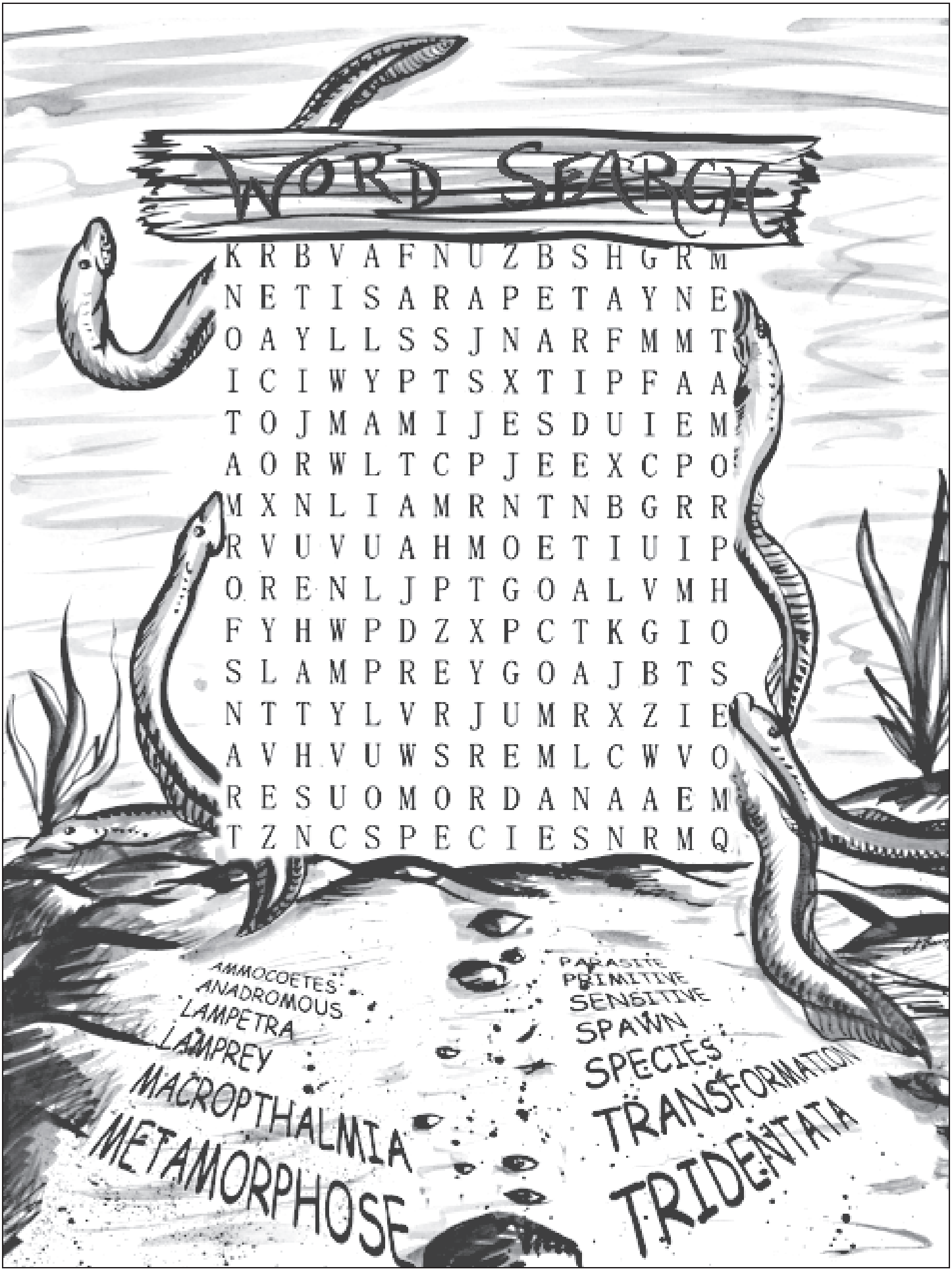


At first glance, you may think it's an eel or even a snake, but it's not. It is a Pacific lamprey. Lampreys are very strange looking fish with their round sucking mouth and eel like bodies. This fascinating creature has no paired fins, jaws, or bones. Their unique life history is similar to the salmon who share the rivers of the Pacific Northwest.

Lampetra tridentata is the scientific name for Pacific lamprey. Loosely translated, it means "three-toothed stone sucker." The Pacific lamprey swims by wriggling back and forth in the water. In swift currents, they often suck onto rocks with their mouth to rest and hold fast in the current. With a burst of energy, they move upstream and attach to another rock. They continue this way upstream.

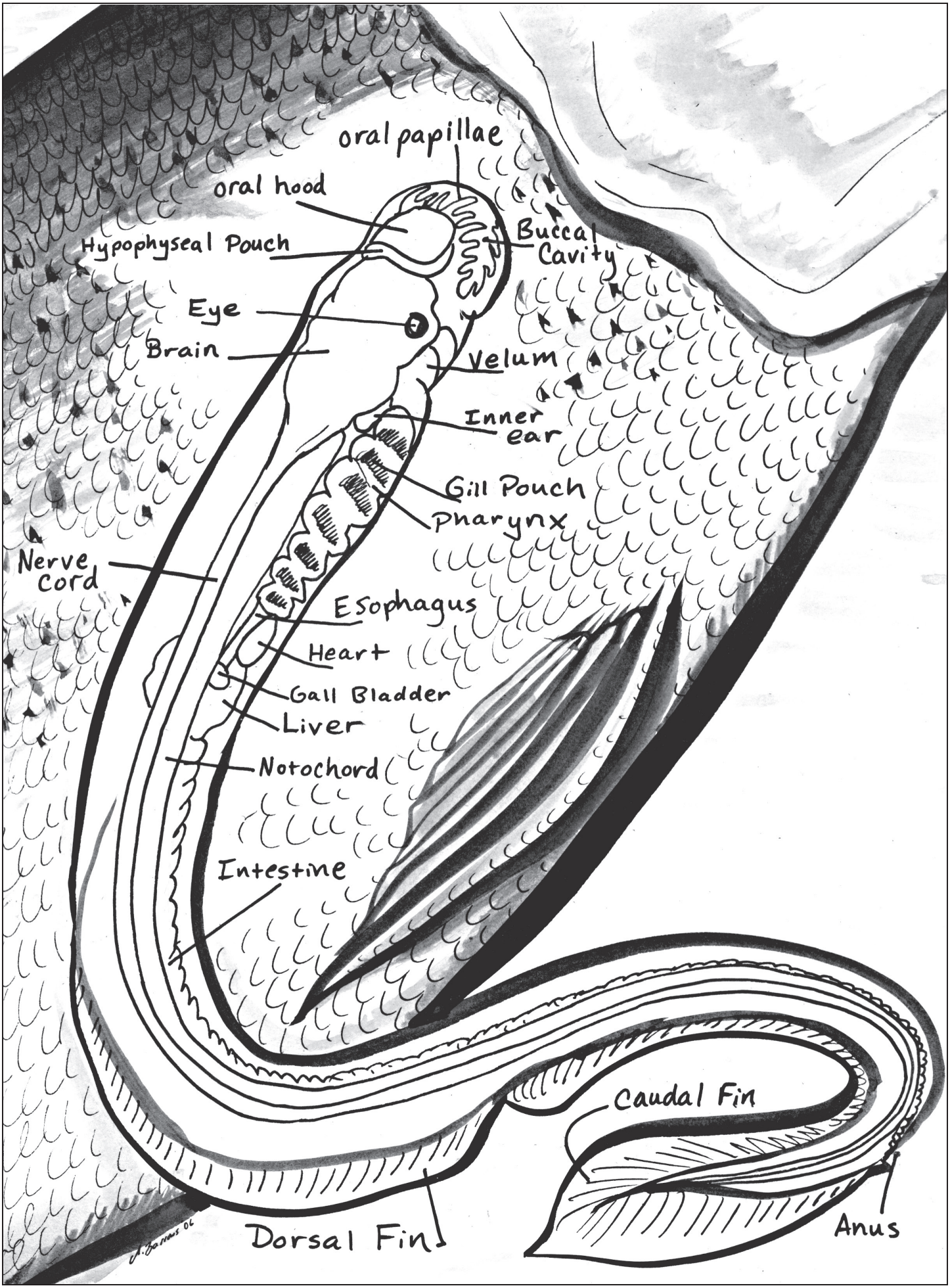


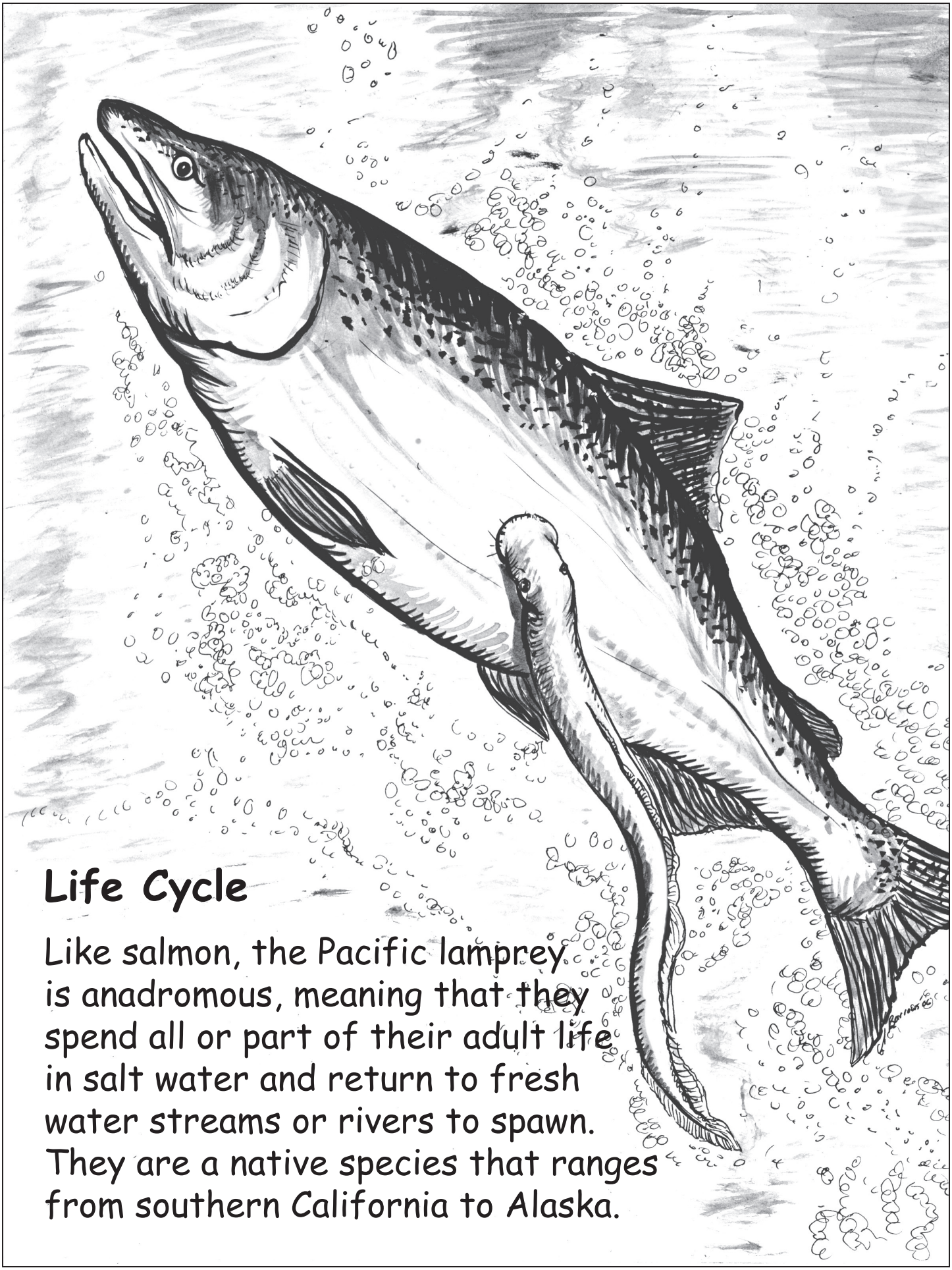
Lampreys are the oldest fish alive today with a fossil record as far back as 500 million years. Like the sturgeon, this fish has not changed much throughout the centuries. The Columbia River Basin is home to 3 species of lampreys including the Pacific lamprey, the western brook lamprey, and the river lamprey.


WORD SEARCH
K R B V A F N U Z B S H G R M
N E T I S A R A P E T A Y N E
O A Y L L S S J N A R F M M T
I C I W Y P T S X T I P F A A
T O J M A M I J E S D U I E M
A O R W L T C P J E E X C P O
M X N L I A M R N T N B G R R
R V U V U A H M O E T I U I P
O R E N L J P T G O A L V M H
F Y H W P D Z X P C T K G I O
S L A M P R E Y G O A J B T S
N T T Y L V R J U M R X Z I E
A V H V U W S R E M L C W V O
R E S U O M O R D A N A A E M
T Z N C S P E C I E S N R M Q
AMMOCOETES
ANADROMOUS
LAMPETRA
LAMPREY
MACROPTHALMIA
METAMORPHOSE
PARASITIC
PRIMITIVE
SENSITIVE
SPAWN
SPECIES
TRANSFORMATION
TRIDENTATA

Anatomy

Outwardly resembling eels in that they have no scales, an adult Pacific lamprey can grow to 30 inches (77 centimeters) long. Lampreys have two dorsal fins, large eyes, one nostril on the top of their head, and seven gills on each side. They have cartilage instead of bones. Since adults feed on bodily fluids of fish and marine mammals, Pacific lampreys do not need a stomach for digestion. Lamprey bodies are round, long, and flexible. Adult Pacific lampreys are a dark bluish grey when they first enter freshwater and turn reddish brown in color when spawning.


oral papillae
oral hood
Hypophyseal Pouch
Buccal Cavity
Eye
Brain
Velum
Inner ear
Gill Pouch
Pharynx
Nerve Cord
Esophagus
Heart
Gall Bladder
Liver
Notochord
Intestine
Caudal Fin
Dorsal Fin
Anus



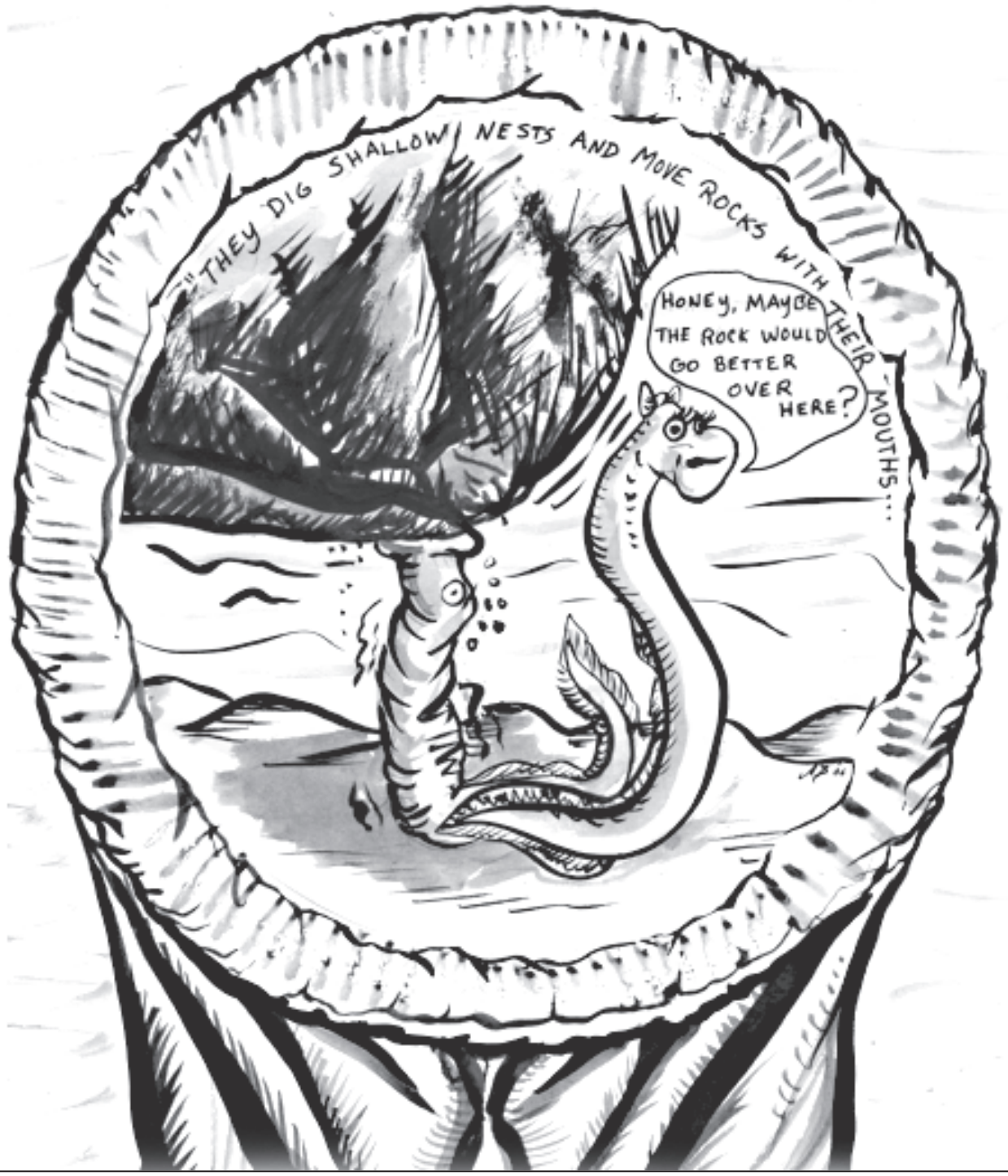
Life Cycle

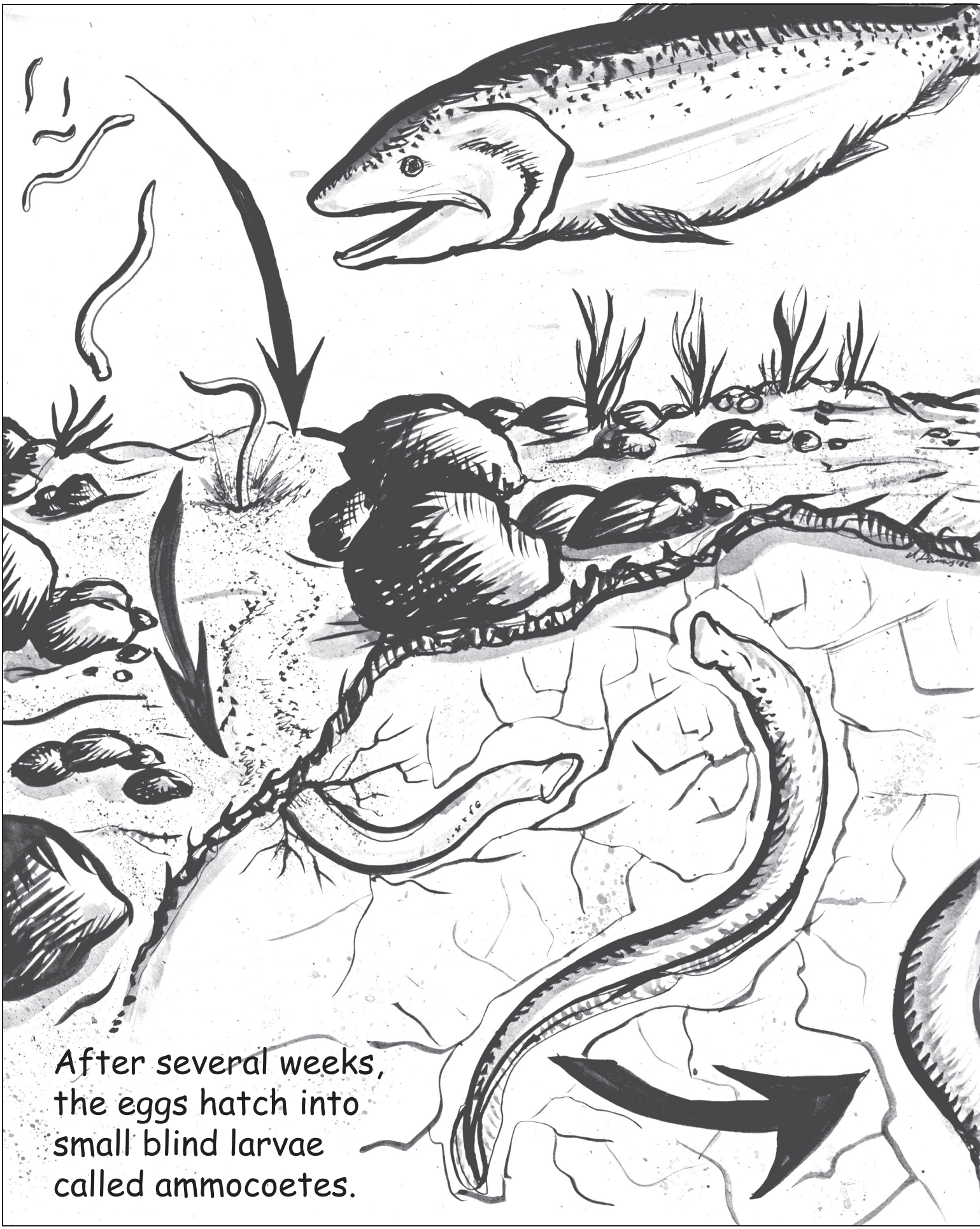
Like salmon, the Pacific lamprey is anadromous, meaning that they spend all or part of their adult life in salt water and return to fresh water streams or rivers to spawn. They are a native species that ranges from southern California to Alaska.

Pacific lampreys live in the ocean as adults for 2 to 3 years, where they are external parasites on fish and marine mammals. A hungry Pacific lamprey will grip onto the side of a fish or marine mammal with its teeth. Its tongue, which has sharp edges like a file, will then make a hole in the animal, allowing the lamprey to feed on blood and other bodily fluids. This rarely kills the animal. Once full, the lamprey falls off until it is hungry once again.

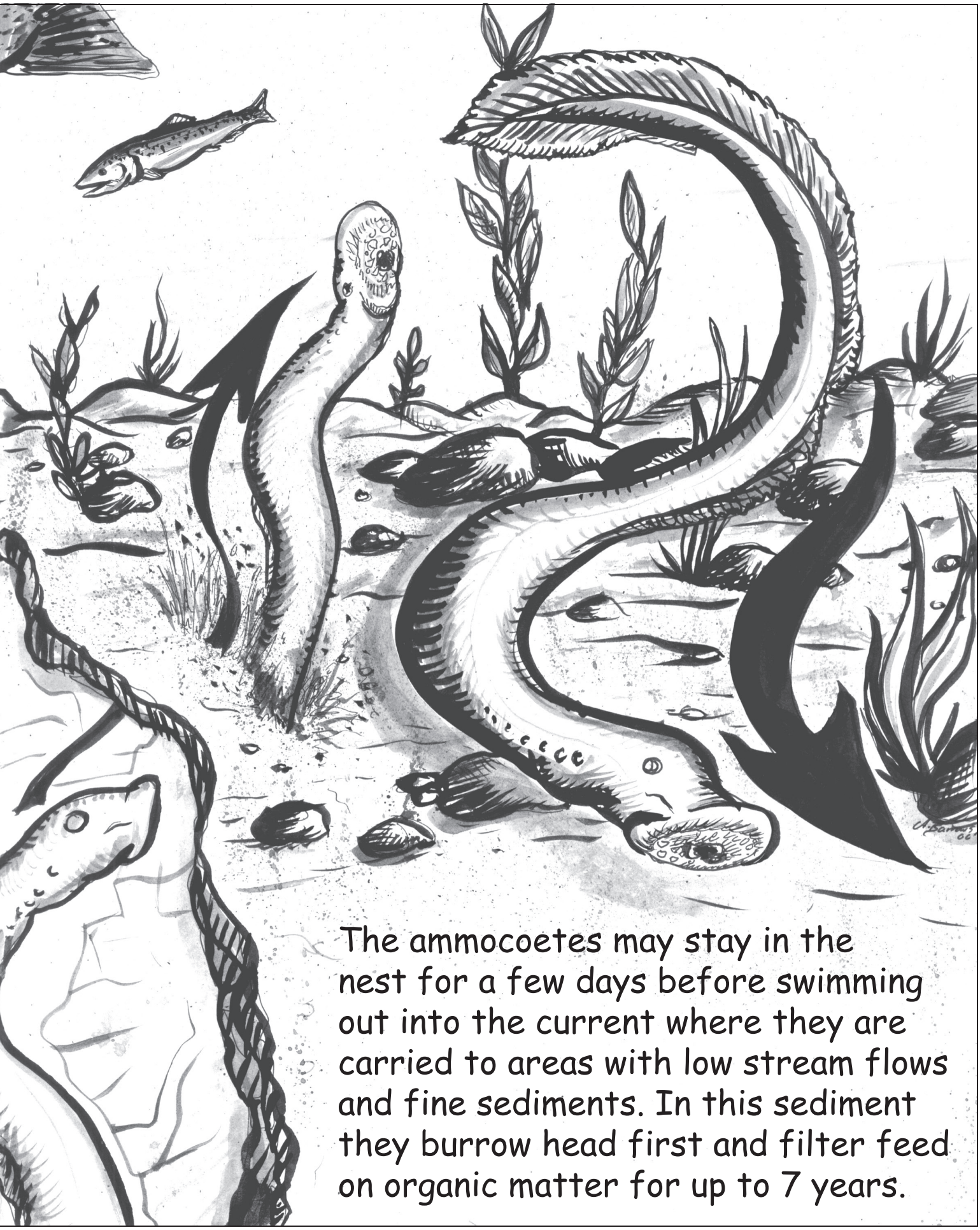
Adult Pacific lampreys enter freshwater between July and September and spawn the following spring. Like salmon, Pacific lampreys do not feed during their upstream migration in freshwater.

Mating pairs of lampreys dig shallow nests in small gravel by moving their tails rapidly. They move larger rocks with their mouths. A female lamprey can lay 10,000 to 200,000 eggs. After spawning, Pacific lampreys die within a few days.

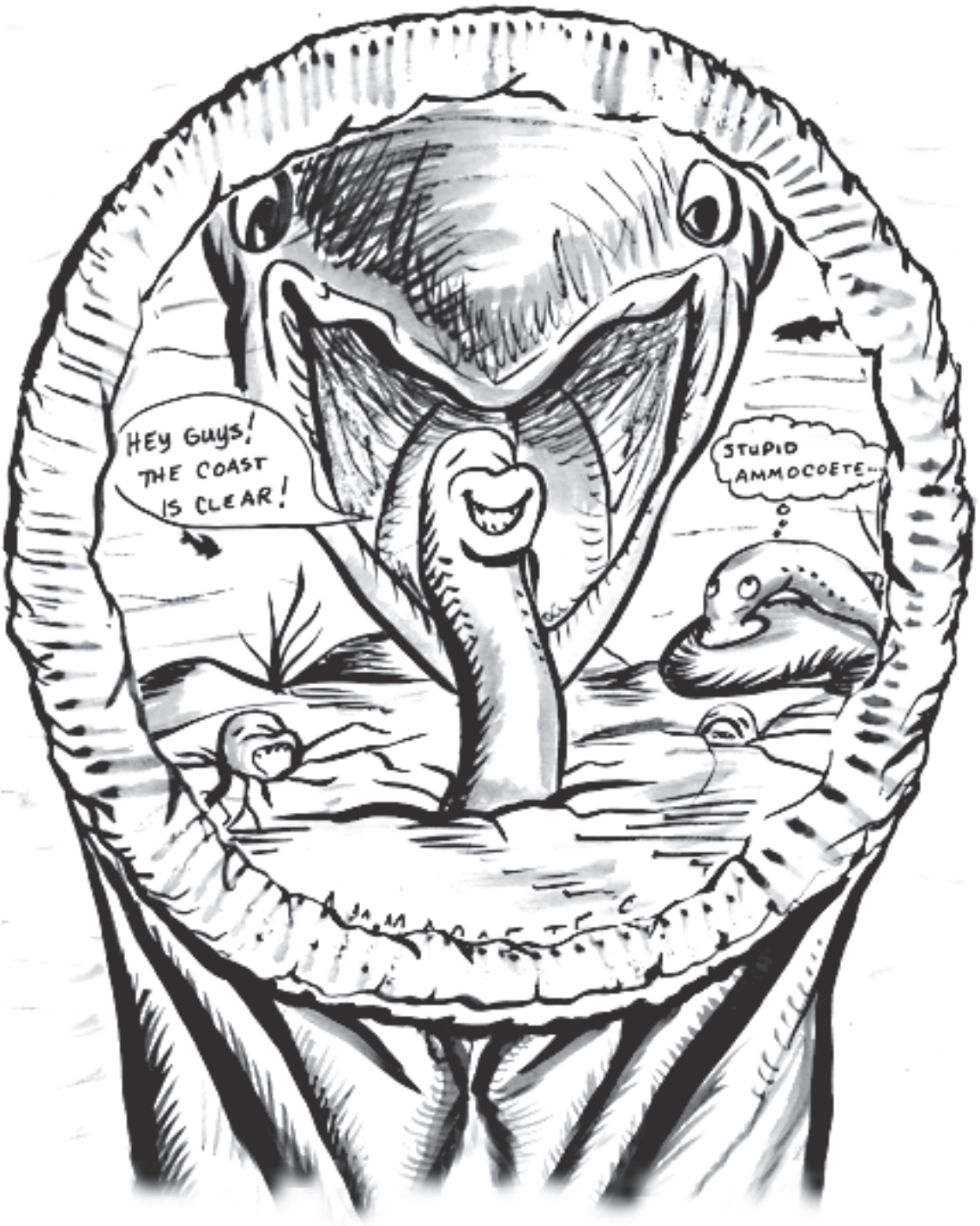




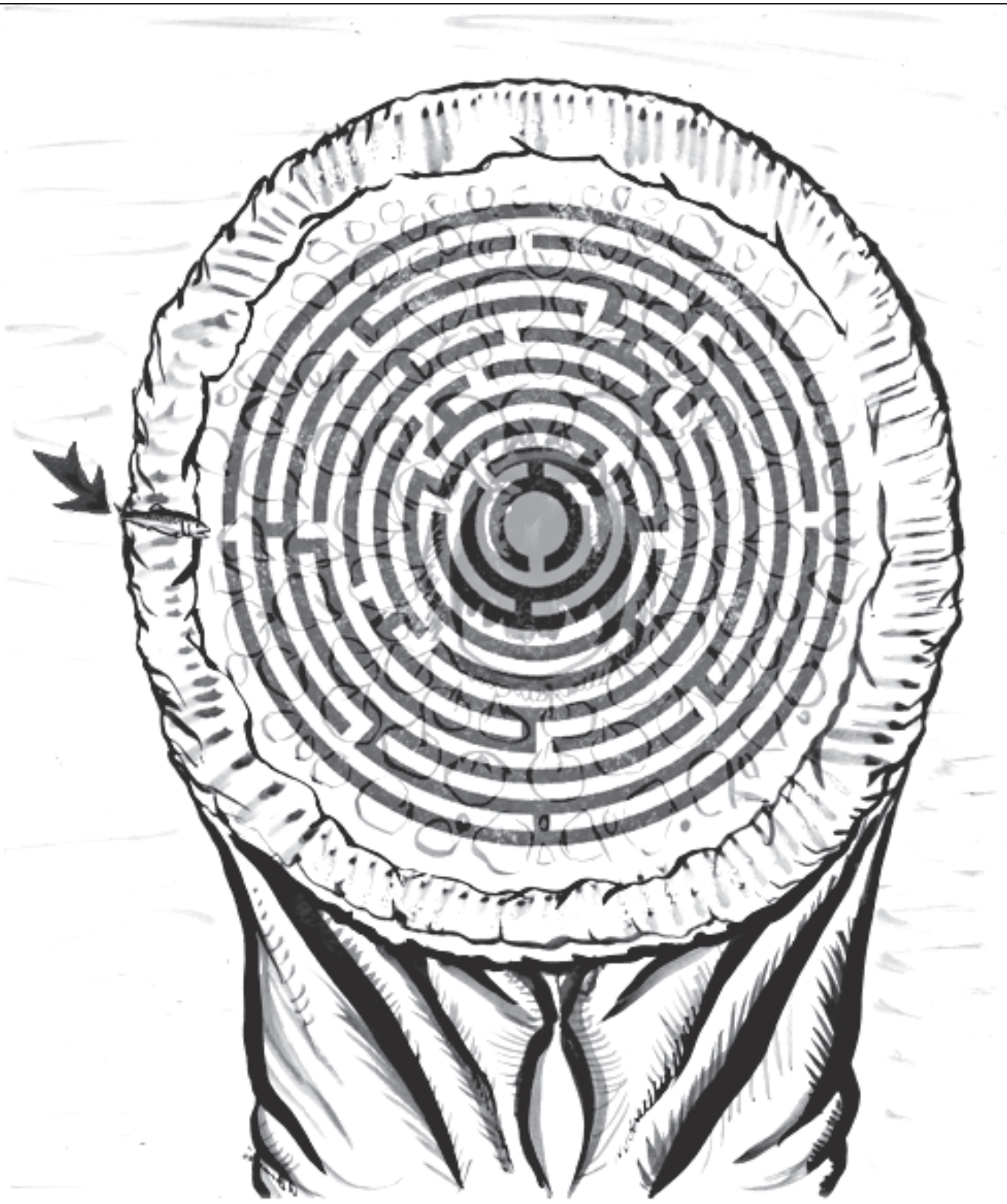
After several weeks, the eggs hatch into small blind larvae called ammocoetes.



The ammocoetes may stay in the nest for a few days before swimming out into the current where they are carried to areas with low stream flows and fine sediments. In this sediment they burrow head first and filter feed on organic matter for up to 7 years.



After 4 to 6 years, while still buried in sediment, the ammocoetes undergo a transformation, or metamorphosis, into a "smolt"-like stage called macropthalmia. They develop eyes, a sucking disc with teeth, emerge from the sediment, and migrate downstream to the ocean.



Take a swim through the maze to get to the ocean. Leave the nest after hatching into an ammocoete and make your way in the maze to metamorphose into a macropthalmia and become an adult.

Cultural Significance

Pacific lampreys are one of the many religious and subsistence foods of the Native Americans in the mid-Columbia River Plateau. Although lampreys are called *ksuyas* or *asum* in the Sahaptin native tongue, many people refer to the Pacific lamprey as "eel." Fishing for lampreys is done by hand, dip net, or long pole and hook at sites where lampreys gather together, such as below falls or rapids.

Pacific lamprey also have medicinal value to Tribal peoples. Oil collected from drying lampreys is applied to the skin or other ailing parts of the body. Historically, the oil was used to condition hair and to cure ear aches.

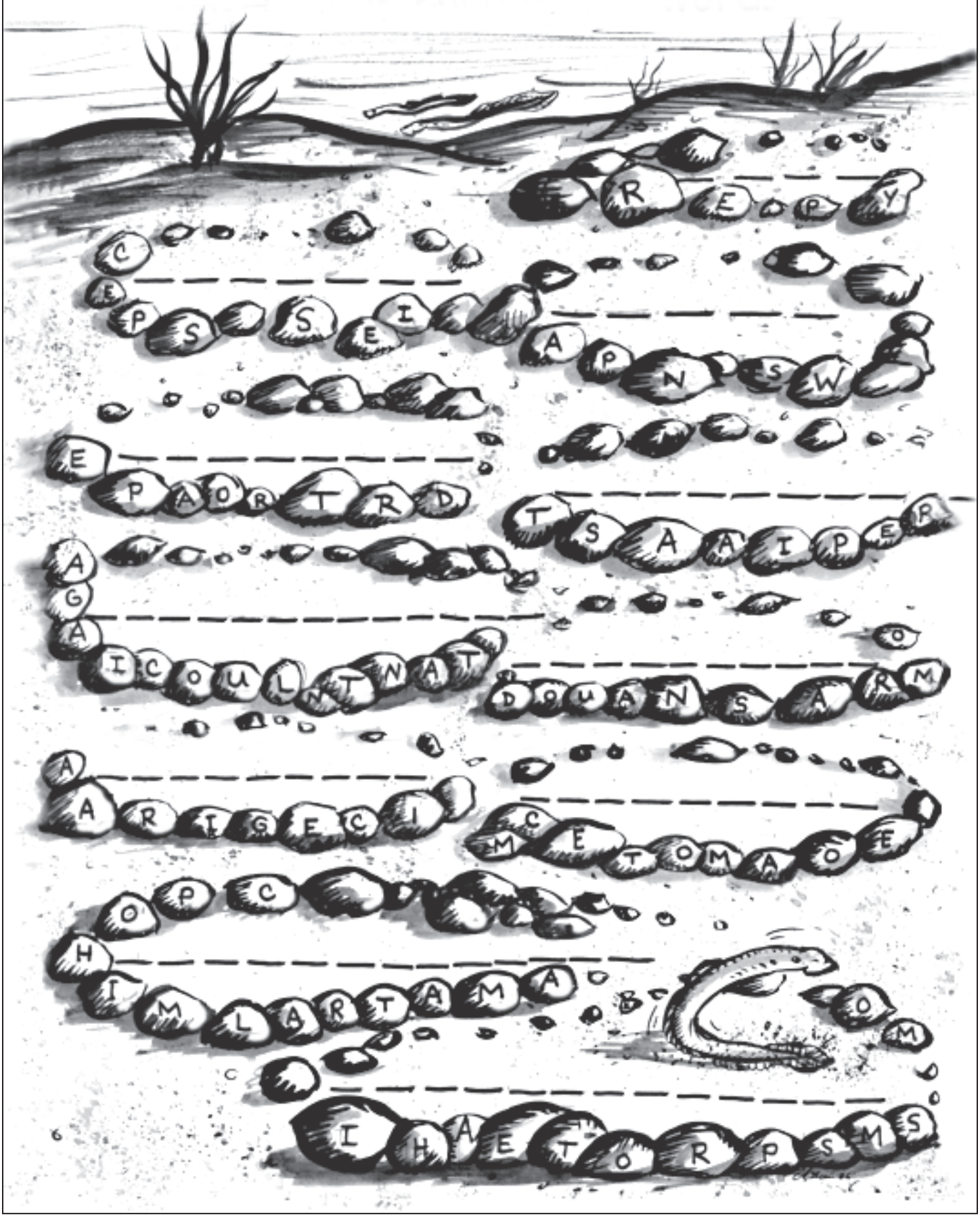
Early fur traders used Pacific lampreys for food and also found that lampreys were good bait for trapping coyotes. In the early days of fish hatcheries, raw ground Pacific lamprey proved to be a premium feed for young salmon.

A commercial fishery for Pacific lampreys began in 1941 at Willamette Falls. Primary use of the fish was for vitamin oil and protein food for livestock, poultry, and fishmeal. Today, lampreys continue to be important for scientific research (medicinal anticoagulant), teaching specimens, and food (export to Europe).

Why are Pacific lamprey populations declining?

Lamprey populations are declining for many of the same reasons as salmon. Habitat destruction, water pollution, forestry practices, and dam passage have made survival very difficult. Since lamprey larvae filter water and mud during the first 2 to 6 years of their life, they are very susceptible to pollutants from urban or agricultural runoff. Urban development, forestry, and agricultural practices have resulted in a loss of wetlands, side channels, and beaver ponds, which the Pacific lamprey ammocoetes prefer. Increases in stream temperature also may reduce the lamprey's food supply.

Unscramble each of these words.



Why are Pacific lampreys important?

- Lamprey ammocoetes are a known food source for other fish and birds.
- Adult Pacific lampreys may act as a buffer for migrating adult salmon from predation from marine mammals.
- Pacific lampreys, like salmon, return important marine nutrients to the freshwater systems in which they spawn and die.
- Pacific lampreys remain important to the Native Americans both culturally and as a food source.
- Today, Pacific lampreys are used for research, education, and anticoagulants.

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2
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VIEWING WINDOW

Crossword Puzzle Clues

Across

6. The life history of a lamprey is similar to this fish
8. A substance that hinders the clotting of blood
9. An animal that is eaten by another animal
10. Native Americans sometimes call the Pacific lamprey this

Down

1. A Pacific lamprey has 7 of these on each side
2. The place where adult Pacific lampreys spend 2 or 3 years
3. Instead of bones, a lamprey has this
4. The lifestage when lampreys migrate to the ocean
5. The larval stage of a Pacific lamprey
7. An animal that lives in or on a host and obtains nourishment from it without benefiting the host

Crossword Puzzle Answers

Across

6. Salmon
8. Anticoagulant
9. Prey
10. Eel

Down

1. Gills
2. Ocean
3. Cartilage
4. Macropthalmia
5. Ammocoete
7. Parasite

What Are We Doing to Help Lamprey?

In order to determine how we can best recover or conserve lamprey populations, scientists must first understand them. The historical distribution and abundance of lampreys is being determined to understand which populations may be more at risk. At present, biologists are determining which habitat the different life stages prefer and learning more about their spawning behavior. Researchers are studying the effects of contaminants and rising temperatures on lampreys.

Migration timing by juveniles and adults and how it relates to stream conditions such as flow and temperature is being researched. Sampling techniques are being improved so that populations may be monitored more closely. Passage at dams, culverts, and other barriers for anadromous fish are being improved by retrofitting the salmon passage structures (such as fish ladders) to be more lamprey friendly or removing them altogether. After stream conditions have been improved, lampreys are also being reintroduced into those streams which no longer have lamprey populations.

Notes From Your "Experience"

Your Page: Stories and Artwork

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Item # FW 3011 March 2012