



NOAA
FISHERIES

Pacific Islands
Regional Office



Habitat Mapping:

Follow 'Ō'io Throughout Their Life Cycle

Marine animals often rely on many different habitats throughout their lives. Map the life cycle of 'ō'io (Hawaiian bonefishes) to learn where they spend their life from egg to adult. The map activity on the following pages will follow the life cycle of the round jaw bonefish.

Did You Know?

Hawai'i is home to two species of bonefishes ('ō'io). One, the sharp jaw bonefish, is **endemic**, which means it's found nowhere else in the world!

What's in a Name?

Bonefishes in Hawai'i are known by many names.

- **round jaw bonefish** - common name for the Pacific-wide species that's found in Hawai'i
- **sharp jaw bonefish** - common name for the endemic Hawaiian species
- **'ō'io** - the Hawaiian name (can refer to both species)

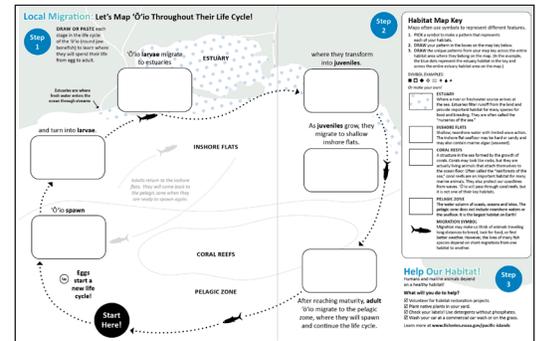
You Will Need

- ★ Printer to print your map outline
- ★ Tape
- ★ Colored pencils, crayons, or markers
- ★ Scissors (optional)
- ★ Glue (optional)

How to Make Your Map

1. Print all 3 pages on separate pieces of paper.
2. To make your map, tape pages 2 and 3 together, with page 2 on the left and 3 on the right.
3. Draw the 'ō'io life stages pictured below in the corresponding life stage on the map. **HINT:** Some life stages will occur in more than one habitat!

ALTERNATIVE OPTION: Color and cut out the life stage images below, and paste them on the map.



Your map **taped together** should look like the image above.

Follow the 'Ō'io Life Cycle

A life cycle is the series of changes that a living thing undergoes throughout its lifetime. These changes affect what it can do and what its body looks like. Below are different stages in the 'ō'io life cycle that you will draw or paste on the map.

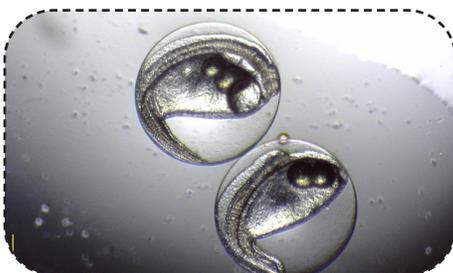


Photo credit: Jon Shenker

Egg/Spawning- adult fish scatter and fertilize eggs.



Larval- early life stage that occurs after hatching but before the fish develops into a juvenile; may look very different than juvenile/adult fish; one individual is called a "larva" (pronounced LAR-VUH) and more than one are called "larvae" (pronounced LAR-VEE).



Juvenile- life stage where fish resemble small adults



Photo credit: Keoki Stender

Adult- life stage when a fish reaches maturity (able to spawn)

Local Migration: Let's Map 'Ō'io Throughout Their Life Cycle!

Step
1

DRAW OR PASTE each stage in the life cycle of the 'ō'io (round jaw bonefish) to learn where they will spend their life from egg to adult.

Estuaries are where fresh water enters the ocean through streams

'Ō'io larvae migrate to estuaries

ESTUARY

and turn into larvae.

INSHORE FLATS

Adults return to the inshore flats. They will come back to the pelagic zone when they are ready to spawn again.

'Ō'io spawn

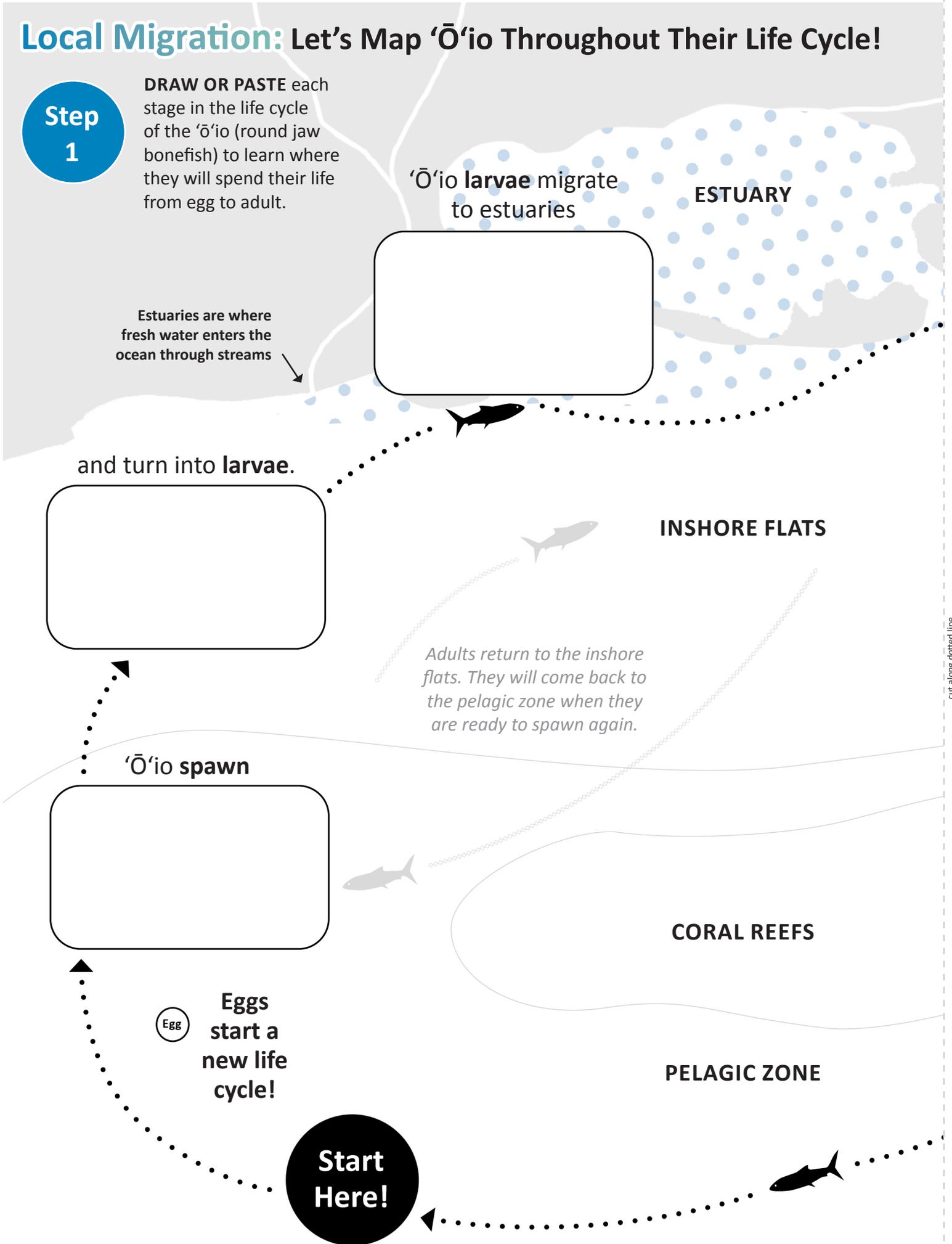
CORAL REEFS

Eggs start a new life cycle!

PELAGIC ZONE

Start Here!

cut along dotted line

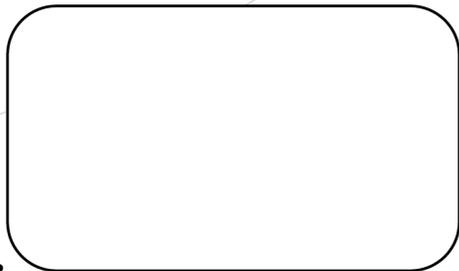


Step 2

where they transform into juveniles.



As juveniles grow, they migrate to shallow inshore flats.



After reaching maturity, adult 'ō'io migrate to the pelagic zone, where they will spawn and continue the life cycle.

Habitat Map Key

Maps often use symbols to represent different features.

- PICK** a symbol to make a pattern that represents each of your habitats.
- DRAW** your pattern in the boxes on the map key below.
- DRAW** the unique patterns from your map key across the entire habitat area where they belong on the map. (In the example, the blue dots represent the estuary habitat in the key and across the entire estuary habitat area on the map.)

SYMBOL EXAMPLES:



Or make your own!



ESTUARY

Where a river or freshwater source arrives at the sea. Estuaries filter runoff from the land and provide important habitat for many species for food and breeding. They are often called the "nurseries of the sea."



INSHORE FLATS

Shallow, nearshore water with limited wave action. The inshore flat seafloor may be hard or sandy and may also contain marine algae (seaweed).



CORAL REEFS

A structure in the sea formed by the growth of corals. Corals may look like rocks, but they are actually living animals that attach themselves to the ocean floor. Often called the "rainforests of the sea," coral reefs are an important habitat for many marine animals. They also protect our coastlines from waves. 'Ō'io will pass through coral reefs, but it is not one of their key habitats.



PELAGIC ZONE

The water column of coasts, oceans and lakes. The pelagic zone does not include nearshore waters or the seafloor. It is the largest habitat on Earth!



MIGRATION SYMBOL

Migration may make us think of animals traveling long distances to breed, look for food, or find better weather. However, the lives of many fish species depend on short migrations from one habitat to another.

Help Our Habitat!

Humans and marine animals depend on a healthy habitat!

What will you do to help?

- Volunteer for habitat restoration projects.
- Plant native plants in your yard.
- Check your labels! Use detergents without phosphates.
- Wash your car at a commercial car wash or on the grass.

Learn more at www.fisheries.noaa.gov/pacific-islands

Step 3