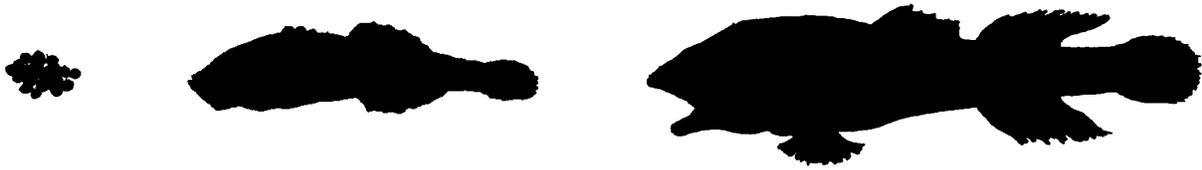


Goby ('o'opu nākea)



The 'o'opu nākea is the most common of the five gobies that live in Hawaiian streams. The 'o'opu begins its life as one of many eggs deposited in a stream. The eggs are fertilized by a male. Soon after, the eggs hatch into microscopic larvae. The larvae are swept downstream and out to sea. The larvae are not yet formed into fish like their parents. Most of their fins including their "suction cup" fin, are not yet fully formed.

Scientists have discovered that 'o'opu nākea larvae spend about five months in the ocean before they change into small fish or fry. The small fry are only 2 cm (less than 1 in.) long when they return to a stream to live. They have clear bodies and large eyes near the top of their heads. They swim along the bottom of streams, using their suction cup fin to cling to rocks. When the young fish crawl upstream, they can climb up 120 cm (4 ft) of wet slippery rocks in only one minute! The fish have been seen hanging upside down as they make their way up waterfalls.

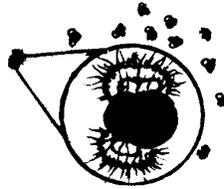
The Hawaiians called the small fry *hinana*. Before people began to change streams, there used to be many more 'o'opu than there are now. Hawaiians watched for the large schools of hinana and caught them with nets as the fish returned to the streams. One kind of 'o'opu was a symbol of good luck. It was fed to babies as a first solid food so that good luck would cling to the child like the fish clings to a rock. If they are not eaten by predators, 'o'opu nākea can grow to be more than 30 cm (1 ft) long.

1. Did 'o'opu reach the islands as eggs, larvae, or adults?
2. Work together as a group to make one of the adult goby's body parts. Be sure you can describe how this body part helps the animal survive. Make three of the same body parts to be used in a class game.

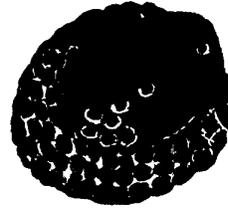
Snail (*hīhīwai*)



egg capsule



larvae



adult

The *hīhīwai* is one of two endemic stream snails. It begins its life as one of many larvae inside an egg capsule (containing 150–350 larvae). Egg capsules are deposited on rocks or on the shells of other snails in a stream from June–August. When the egg capsule breaks open, the newly hatched larvae are swept out to sea by the stream current. The microscopic larvae have a tiny shell with two fleshy “flaps” or lobes ticking out. These look like wings covered with tiny hairs. The hairs are actually tiny cilia or cells that move. The movement helps the tiny larvae to stay up in the water and bring in food. While in the sea, the larvae eat microscopic plants and animals. They change into a new form, a young adult, before they make their way back into a stream.

The young adults are very tiny snails, only 1 mm (less than 1/8 in.) long. They have a strong muscular “foot” that sticks out of their shells. This foot helps the *hīhīwai* cling to wet rocks and climb upstream. The snail’s flattened shell also makes it easier for it to move against the rushing current. The *hīhīwai* has been found 360 m (1,200 ft) above sea level. The adult *hīhīwai* looks like a large, flattened *pipipi* with its black rounded shell. *Hīhīwai* are rarely seen during the day. They hide between rocks from birds such as the ‘*ūlili*. If an ‘*ūlili* finds a snail it cracks the snail’s shell open with its long sharp beak.

1. Did native snails reach the islands as eggs, larvae or adults?
2. Work together as a group to make one of the adult snail’s body parts. Be sure you can describe how this body part helps the animal survive. Make three of the same body parts to be used in a class game.

Prawn (*‘ōpae ‘oeha‘a*)

‘Oeha‘a means crooked or to walk crookedly. The Hawaiians called the native prawn *‘ōpae ‘oeha‘a* because it looks like it walks crookedly with only one large claw. This fierce-looking claw is used to defend territory and to fight for a female prawn. The *‘ōpae ‘oeha‘a* begins life as one of thousands of eggs released by a female in a stream. The larvae are swept out to sea by the stream current. They spend weeks at sea and go through several molts (perhaps as many as 12). With each molt, prawn larvae shed their skin and slowly develop into adults.

As adults, the prawns return to a stream to live. They use their many legs to crawl over rocks and climb upstream using mosses and ferns as ladders. The adults crawl along the bottom of the stream where they feed on small pieces of plant and animal matter.

1. Did native prawns reach the islands as eggs, larvae or adults?
2. Work together as a group to make one of the adult prawn’s body parts. Be sure you can describe how this body part helps the animal survive. Make three of the same body parts to be used in a class game.