

## ***Living Streams in Balance: Makamakaole Valley*** **Plan for Teachers**

Understanding the life cycles of native stream species is critical to their survival. Students will study Hawaiian stream life through observation, discussion, drawing, role playing, snorkeling, and species identification. Students will study and discuss the effects of introduced species, stream alteration, and other human impacts on native stream habitat.

### **Program Objectives**

By the end of the program, students will be able to:

- Identify and describe the fish, shrimp and snails found in Hawaii's streams
- Explain the life cycle and challenges of native freshwater fish in Maui's streams
- Explain how native freshwater species were important to the early Hawaiians
- Describe why native stream species are important today in Hawaii's ecosystems
- Understand the differences between native and non-native species
- Describe what an ahupua'a is and why this concept is still relevant today

**8:00 Arrive at School Pick-up Site:** Introductions and briefing, outline expectations for the day

**8:15 Depart Pick-up Site:** Guide introduces program for the day while driving and discusses the connection of Maui's streams to the ocean, natural streams vs. diverted or channelized streams

### **8:45 Stop at Hale Ki'i Heiau**

- Review Ahupua'a poster, discuss
- Sketch Iao stream below the Heiau
- Discuss the impact of the channelization on stream flow and stream habitat
- Discuss native stream species and review the meanings of "native", "non-native", "invasive", and "Polynesian introduced"

### **9:15 Arrive at Waihe'e Beach Park- Bathroom break and game**

- Using visual aides, identify native & introduces species in Maui's streams; Discuss life cycles
- Water testing (dependent on group level)
- Play "Wild Wanderings" game. Students role play being o'opu & simulate the life cycle of o'opu
- Outfit students with gear for the hike: backpacks, water bottles, tabs, raingear, lunches

**10:15 Leave Waihe'e Beach Park.** En route guides discuss conduct on trails, "leave no trace"

### **10:30 Arrive at Makamakaole Valley**

While hiking, discuss native and introduced plant species along the trail and their impacts on the watershed.

### **10:45 Arrive at Stream - LUNCH**

- Sketch Makamakaole stream and discuss how this stream and their drawings are different from the channelized stream.
- Water testing (dependent on group level)
- Guides lead students to snorkel in streams and look for stream life

**12:20 depart van site Makamakaole** for either restoration project or to go to Waihee Ridge outlook for day summary

**1:30 Arrive at drop off site**