Maui Unknown

High-Altitude Stream Sampling at Haleakalā NP

At the request of the park, the PACN recently sampled streams at high altitude in Haleakalā National Park on Maui. The team implemented the stream monitoring protocol at Palikea Stream, which is normally only sampled downstream near sea-level. The park was interested in what fish, snails, and shrimp might live in reaches far upstream.

This sampling trip was a true expedition into the wilderness, and required a lot of preparation. The team had to get trained on helicopter operations and safety. We prepared our normal stream sampling equipment, including a water quality sonde, flow meter, water sampling filter tower, and snorkeling gear.

A four-person, five-day trip to sample streams required two "sling-loads" of supplies. After arriving at the landing zone near the Kīpahulu Visitor center, we spread out two giant nets made of heavy rope. We arranged all our coolers, backpacks, and other supplies into the centers of the nets. Then the nets were closed around the supplies and fastened with heavy gauge steel cables.

The helicopter, bright orange with stripes, with a small bubble for a passenger and high skids, swooped in overhead and landed in the middle of the field. I was escorted to the door. I climbed in, put my harness on, and plugged my headset in. Or rather, I had help doing all these things, since it was my first heli-op. It was so noisy I couldn't speak to anyone. Once my escort climbed in and got settled, up we went.

We soared over the rainforest climbing high into Kīpahulu Valley. There are no roads, no trails, and no real landmarks besides the streams and topography of the land itself. The flight only took about five minutes. We landed in a small patch of high grass among ʻōhiʻa trees. My partner led me away from under the spinning rotors to the tree line. Once the rest of the team joined me, we made our way through the dense forest, climbing over roots and branches to our home for the next five days... Delta Camp. It's a shack (photo on right) built in the forest with a single small room and a tank for catching rainwater.

Twenty minutes later, we heard the helicopter approaching, and it hovered directly over the camp. The rotor wash drowned out all other sounds and everything shook in the artificial wind. A sling load was lowered out of the sky onto the ground right next to the camp. The cable separated, and the ship flew away. We move all the supplies out of the way, and a second sling load arrived. As the ship left it toggled its siren to say farewell. The sound of rotors fades away.

We were there to survey Palikea Stream at an altitude of 4,000 feet. Between our location and the famous pools at ʻOheʻo several miles away are literally dozens of waterfalls; some several hundred feet high. But it was possible that fish were there, as some can configure their ventral fins to form a kind of suction cup, and literally scale vertical rock walls under waterfalls. We scouted the stream nearby, and decided it was suitable to sample. The next day we would scout another location downstream.

This place is cold and wet. The dense forest surrounded us with ʻōhiʻa trees, hāpuʻu, shrubs with wide succulent leaves, and stands of small climbing ferns. Bird songs abound, but it was difficult to spot them.

Our first survey revealed no fish in the stream. In fact there were no snails, no shrimp, and almost no algae growing on the rocks. It appeared as if the gravel and rocks in this area are repeatedly scoured, preventing biofilm from developing. We did find rare ferns along the bank, and a small aquatic beetle. This stretch of the stream ends in a tall waterfall. Perhaps the geomorphology of the stream is such that the water is concentrated in a small area, creating high turbulence that rolls the rocks and scours them clean.

The next day we moved downstream through the forest. It was slow going. We frequently had to crawl under brush and take detours around thick vegetation. We were headed for a spot on the map that looked to be safe access to the stream. When we arrived we looked down on the stream from the tops of cliffs. There was no safe place to access the stream, let alone sample, so we had to abandon this area. Another slog through the rainforest and we arrived back at camp. Fog rolled in, obscuring the surrounding mountains. We discussed our options and decided to try a different stream that runs parallel to Palikea, nicknamed ʻŌpae Stream. Judging by the name we thought there ought to be shrimp. To get there we'd have to cross Palikea. It was a concern because if the water rose, we could be trapped on the other side. Had there been heavy rain overnight, and the Palikea was high, we wouldn't have attempted it. By morning the weather stayed clear, and Palikea was flowing normally. We crossed and found ʻŌpae Stream.

This stream is remarkably different. It flows through a flatter, more open area with trees. Moss covers rocks. There is algae growing on most surfaces. We did find shrimp, but no fish. Is there one particular waterfall that they can't overcome somewhere downstream?

We explored upstream until we got to another several hundred foot waterfall. One biologist, who has worked in the area many times over the past twenty years removing invasive plants, had never been to the end of this particular stream. I wonder if the ancient Hawaiians pushed this far into the forest. We might be the first people to see this particular place in 500 years, or ever.

The information we gathered will help to characterize water quality, the physical habitat, and spatial distributions of animals populations in Kīpahulu Valley in areas never before surveyed. In future trips we will survey downstream to try and determine how far upstream stream animal populations extend.

The next day we broke camp, packed up, and carried every cooler and bag through the forest to the landing zone. It was time to head back. We were thoroughly tired, and thoroughly inspired.

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