Bonefish Paradise

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The gradient of blue-green colours of the lagoon surrounded by Anaa Atoll is like a paint swatch (Photo 1). Surely, this is where they found the name for the colour they call "aquamarine," because the spectacular lagoon literally glows this intense shade all day long; in fact, that glow is so intense that the clouds even reflect the colour. Anaa is one of many atolls in the tropical Pacific Ocean, a ring of islands bordered by a reef and encircling a shallow lagoon filled with life. Anaa is part of the French Polynesian archipelago and is gaining notoriety as a haven for recreational fishing.

Only about 500 people call Anaa home, but a small waterfront hotel is increasingly seducing international tourists to the wild sapphire lagoon, which is emerging as a premium catch-and-release flats fishery. Flats fishing is a dominant fishing sector in the tropical Atlantic and is emerging in the Pacific, where the many islands and atolls create perfect habitat for big bonefish (*Albula glossodonta*) and trevally (*Caranx ignobilis, C. melampygus*). It may seem fantastical to suggest that there are still new fisheries to be discovered, places where anglers are scarce and the fish are equally naïve to anglers, but if there were such a place, it would be in Anaa, which sees maybe a handful of secretive anglers each year.

The bonefish grow quickly in Anaa's warm lagoon, and are hard fighters when hooked on the fly. However, bonefish share the lagoon with blacktip reef sharks (*Carcharhinus melanopterus*), which we suspected to be effective bonefish predators. Post-release predation therefore posed a concern to recreational angling sustainability but could potentially be mitigated by appropriate fishing practices. Our mission was therefore to monitor the extent to which post-release predation was a relevant concern in the recreational bonefish fishery and develop best-practice recommendations to the emerging recreational fishing sector.

We carried fly fishing rods, tagging equipment, and a small temporary bobber tag with us out to the flats of Anaa Atoll and captured bonefish from October 20 – December 15, 2016. Slowly, we staked out the flats for bonefish, which were themselves in search of food. As the sun rose above our heads, we could see the distant shadows of sharks that had a mutual interest in searching for bonefish (Photo 2). We had good success finding big bonefish, and angling quickly turned into science. Landed bonefish were handled to simulate angler handling practices: 0, 10, or 30 s air exposure and quickly secured with a small hook through the dorsal muscle to our GPS, a spinning-style fishing rod with a colourful foam float to visually track the fish's movement along the flat and off the drop off in the lagoon. The rod helped us break off the fish after verifying the fish's survival.

Bonefish tended to rapidly swim off the flats and into the deeper part of the lagoon after they were released; we sensed they knew that the sharks would quickly find their trail. Indeed, sharks are attuned to the scent of a stressed bonefish and we found that they often intercepted the scent of bonefish exiting the flats, with a predictable ending. Amazingly, however, we found that post-release predation increased when bonefish were air exposed for longer intervals, indicating a direct relationship between angler handling practices and fish survival.

Even though it is well known that air exposure and handling are stressful for fish, it is important to demonstrate to anglers and guides how best practices can actually contribute to fish survival after release. Our research supports a recommendation that bonefish not be air exposed by anglers and we suggest that anglers take steps to release bonefish as rapidly as possible after they capture them in order to reduce the probability of shark detection and post-release predation. In addition, anglers and guides should be aware of their surroundings while fishing and avoid fishing in locations where sharks are exceptionally abundant. These steps can contribute to a reduction in post-release predation and higher sustainability of bonefish fishing in

Anaa. Ultimately, the people of Anaa will be able to benefit from a stronger tourist economy catalyzed by a sustainable recreational fishery for bonefish fishing in the jewel-coloured lagoon (Photo 3).

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Photos

Photo 1. Big bonefish (*Albula glossodonta*) in Anaa frequent these shallow flats inside the lagoon to feed on benthic invertebrates.

Photo 2. Blacktip reef sharks (*Carcharhinus melanopterus*) patrol the flats at Anaa and can detect the scent of a bonefish (*Albula glossodonta*) in distress.

Photo 3. Collaborating with locals to identify best practices is key to a successful and sustainable recreational fisheries sector for the people of Anaa.