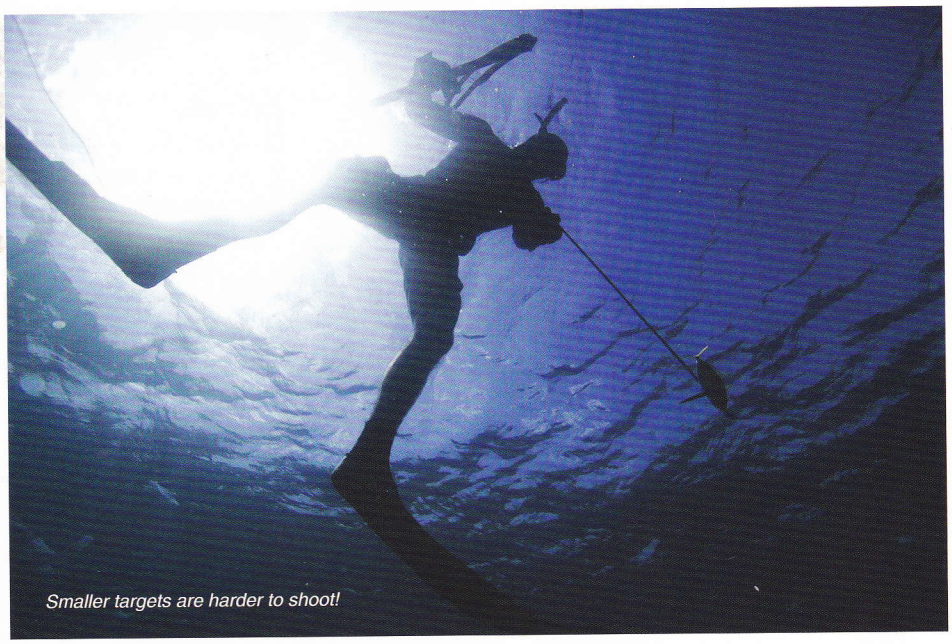
SMALL FISH FUTURE

Tom Rayner & Roger Scott

The year is 2050. It's a bright Winter day. You're unplugged, for once, and feel like a spear. You grab your gear and jump on the Hover Bus with the cloying masses heading to the Flood Zone. The driver yells at a young clone. "Some things never change," you think. You try to tune out the humanity around you, already imagining yourself gliding out to your favourite spot, pushed along effortlessly by your Leg Jets. You hop off at the last stop, a block from the old coastline. You wade through the warm, knee-deep water, past the blocks of flooded, derelict shops. You laugh to yourself, remembering how many climate sceptics were lynched here when the waters rose.



Smaller targets are harder to shoot!

Activating your Second Skin, you flop into the water. As normal, it's just jellyfish and Yakkas as far as the eye can see, as it has been for the last 20 years. Since world fish stocks crashed due to poor management, overfishing, and climate change, nothing bigger than a sardine has been caught. Undaunted, you head out and proceed to chase and ambush the endless schools of Yakkas. You're not as young as you used to be, but an hour later you reboard the Hover Bus with your brace of 15 Yakkas, ignoring the scowls and mutterings from the skinny vegans in the front row, happy in the knowledge that you've once again successfully hunted from the fertile ocean.

On the way home to the Pod, you think back to shooting mostly big or unusual fish and posting 2D-images on the old network using those ancient phones. You remember swimming past hundreds of small fish all the time, but not shooting any of them; you didn't even think to. Now you'd do anything to have another shot at a 10kg Kingfish.

Flash back to 2013. Spearfishing is adamantly defended as "selective" and "sustainable," especially compared to other types of fishing. But, is it really? Could we be heading for a small fish future?

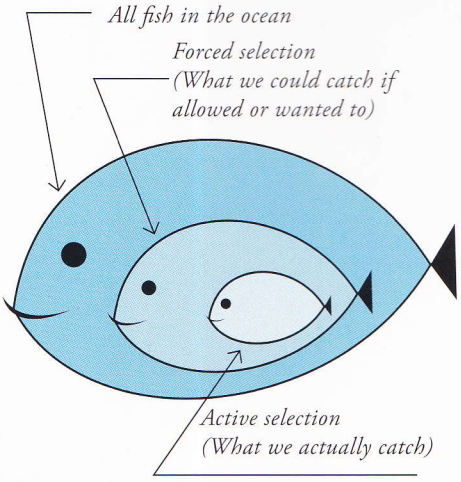
Let's start with selectivity. Out of all the fish in the ocean, many species simply cannot be speared, due to physical limitations of human endurance or gear (too deep, too cold). Other fish cannot be speared due to protective legislation (protected areas, protected species, banned gear types). Divers are fundamentally limited in what fish they can take. Of the remaining fish, individual divers make explicit decisions regarding what fish they do take, and where and when they take them. These factors represent two types of selection: forced and active. So, yes, spearfishing is selective.

Now let's focus on the "active selection" part. This is the only part of the equation that we, as spearfishers, have true control over. At present, there is no doubt that our choices are focused towards larger fish. Bigger fish are more challenging to capture, most are extremely tasty, and all provide more meat per fish than smaller fish. Those smaller fish species (with adults weighing less than 1kg) are not considered to be worth shooting and divers pass up a lot of fish that they could possibly (and legally) shoot.

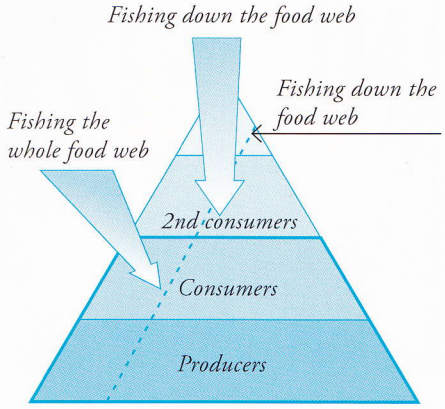
We have previously discussed how the selective removal of larger-bodied individuals can affect fish populations1. For example, if we think back to the simple food webs we learned in biology2, the fish we like to shoot, such as Kingfish, would be somewhere towards the top of the web. Below, these predators are supported by many smaller fish and other critters, which constitute their diet3. The biomass of those smaller fish is many times that of the bigger fish. In order to fish sustainably, we should be fishing all trophic levels in proportion to their abundance. Adopting this approach leaves less of everything instead of changing the structure of the food web.

Regarding sustainability, there are many questions to ask. Is our active selection of larger fish sustainable5? And, more importantly, what do we actually mean when we consider something sustainable? Are we talking about fish for future generations? Are we talking about the current spearfishing catch-per-unit-effort, or the total weight of the spearfishing catch? Do we mean "compared to other fishing activity," or maybe all of these things? Are we also comparing the carbon footprint of different gear types, bycatch rates, and levels of other pollution? Do fish lost to poor holding shots count as bycatch? Unfortunately, we don't have space here to answer all these questions, only to stimulate thought and discussion.

In Australia, spearfishing has been estimated as 1% of the commercial catch6 (for



The nested catch of spearfishers demonstrates the high degree of selectivity.



The food web biomass pyramid. The current approach to fishing chops the top off pyramid, by catching more predators than lower-level consumers. An alternative approach is to fish the whole food web, making the entire pyramid smaller yet retaining the proportions

Would you feel silly posting a photo of a brace of yakkas, as opposed to a large kingfish?

comparison, in parts of the Mediterranean, it is equivalent to 40%)7. In 2012, the total Australian commercial catch was 241,123 tonnes8. Of that, over 80,000 tonnes comprised salmonids, oysters, crabs, and prawns, which we can largely assume are not taken by spearfishing. All other finfish accounted for 119,736 tonnes of the commercial catch, rock lobsters made up 9,628 tonnes, and molluscs (abalone and scallops) added another 12,520 tonnes.

If spearfishing represents 1% of the later groups, the spearfishing catch in 2012 would have been around 1,500 tonnes. If most fish were around 2kg, that would make the catch around 750,000 individual fish. To us, 750,000 fish seems like a high estimate, but even this catch is probably sustainable at large scales and in the absence of other impacts. The question with this is: are our impacts greater (than we might like to believe) at small scales, and are they amplified by other factors, such as overfishing and habitat modification?

As spearfishers, we want long-term viability of local fish stocks and we make efforts to act accordingly. We have seen evidence of this for years. However, it is always important to remain objective about the way we fish and ask if it is something we should be concerned about. If so, perhaps we should fish in a way that helps us retain durable fisheries and food webs. It is a very complex issue and this article is meant to be deliberately provocative, but for spearos that might mean taking fewer large-bodied fish. Just because shooting lots of large fish is legal doesn't necessarily make it wise.

1. Tom Rayner, Spearfishing in Sydney, SDM #36.
2. http://en.wikipedia.org/wiki/Food_web
3. http://www.oceanconservationscience.org/foragefish/files/Little%20Fish,%20Big%20Impact.pdf
4. www.chbf.com/documents/sustainable_spearfishing.pdf
5. http://blog.spearfishing.com.au/commercial-fishing-vs-spearfishing/
6. http://onlinelibrary.wiley.com/doi/10.1111/ele.12028/full
7.http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0~2012~Main%20Features~Fishing~182

Recipe for yakkas wrapped in pancetta

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Baked Yakkas

12 Yakkas
3 cloves of Garlic
1 medium onion
2 bay leaves
6 pieces of pancetta
3 cups of fresh or tinned tomatoes

Place cleaned fish in a baking dish on a bed of chopped onion and garlic. Wrap every second fish in a thin slice of pancetta. Cover fish with chopped tomatoes and insert bay leaves into the mixture. Place in oven at 180°C for 45 minutes. Remove from oven and enjoy!