Pragmatic Reefkeeping: Back to Basics

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The Pragmatic Aquarist

with Richard Cook

Pragmatic Reefing: Back to Basics

Why the simplest answer is so often the right one, and why how we share what we know matters as much as what we know.



Reef keeping rewards attention to the basics. A Euphyllia in one of our systems.

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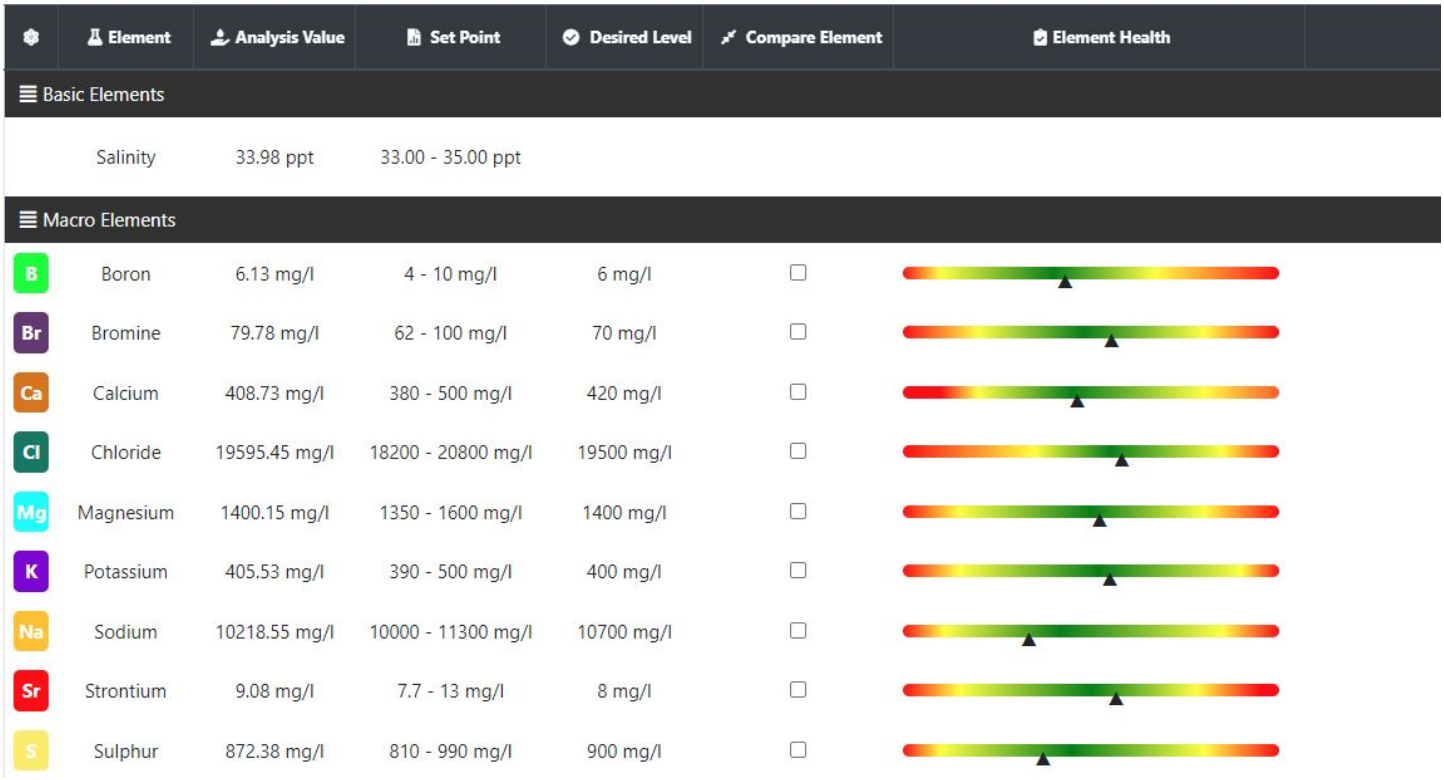
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Pragmatic reef keeping comes down to one unfashionable idea: check the simple things before you go chasing the exotic ones. We now have testing and dosing precision that earlier reef keepers could only have dreamed of, and that is a wonderful thing. But the more sophisticated our tools become, the easier it is to walk straight past the basic parameter that was the problem all along. This is a piece about keeping your feet on the ground.

This piece first appeared in UltraMarine Magazine, the UK's marine and reef-keeping publication. Our thanks to editor John Clipperton and the team for running it.

Pragmatic reef keeping starts with the basics

ICP testing gives us laboratory-grade precision on elements that, 30 years ago, we would only have known about from reading the side of a Tropic Marin salt box, which at the time boasted an unfathomable fifty trace elements. The technology must clearly have existed for them to make that claim, but it was well beyond the reach of us hobbyists and retailers. We now even stock copper on the shelf as a trace element, to re-address imbalances in reef aquariums. Adding copper to a reef tank? A suggestion that would, not so long ago, have seemed nothing short of suicidal. We can make adjustments in the picolitre range, a level of precision that earlier generations of reef keepers could not have imagined.



Element	Analysis Value	Set Point	Desired Level	Compare Element	Element Health
Basic Elements					
Salinity	33.98 ppt	33.00 - 35.00 ppt			
Macro Elements					
B Boron	6.13 mg/l	4 - 10 mg/l	6 mg/l	☐	
Br Bromine	79.78 mg/l	62 - 100 mg/l	70 mg/l	☐	
Ca Calcium	408.73 mg/l	380 - 500 mg/l	420 mg/l	☐	
Cl Chloride	19595.45 mg/l	18200 - 20800 mg/l	19500 mg/l	☐	
Mg Magnesium	1400.15 mg/l	1350 - 1600 mg/l	1400 mg/l	☐	
K Potassium	405.53 mg/l	390 - 500 mg/l	400 mg/l	☐	
Na Sodium	10218.55 mg/l	10000 - 11300 mg/l	10700 mg/l	☐	
Sr Strontium	9.08 mg/l	7.7 - 13 mg/l	8 mg/l	☐	
S Sulphur	872.38 mg/l	810 - 990 mg/l	900 mg/l	☐	

The level of precision we can now attain on elements we would once only have read about on the side of a salt box.

But can such extraordinary precision occasionally blind us to the simpler answer? Do not get me wrong. Exhausting all possibilities, especially when there is an issue to be resolved, is of paramount importance.

Occam's Razor: do not chase zebras

I think the order in which it is examined is equally important. Occam's Razor tells us that when you hear hoofbeats in the distance, do not assume it is a zebra. It is most likely a horse. In other words, the simplest explanation is usually the correct one.

There is a scene in Enter the Dragon where Bruce Lee is teaching a student and points up to the sky. When the student looks at his finger, Lee slaps him and says, "Do not look at the finger or you will miss all of the heavenly glory." I have always liked that. Though I would caveat it with this: just double-check the finger is not broken and is actually pointing in the right direction before you take in the heavenly glory.

> It is like a finger, pointing away to the moon. Do not concentrate on the finger or you will miss all that heavenly glory.Bruce Lee, Enter the Dragon

Even at our own shop, a number of years ago, a member of the team asked if he could do a night shift to explore the possibility of parasites, which must have clearly been attacking the Euphyllias, causing them to shrink away. When I asked him what the specific gravity was, he did not know. He had stopped checking it some time ago, and it turned out that was in fact the problem.

My own rabbit hole

I myself am not infallible to these rabbit holes. I can remember, pre-internet, spending weeks researching why my Xenia had stopped pulsing. Lighting scenarios, trace element additions, nutritional intake, all manner of things. Then I came across a section in Anthony Calfo's Book of Coral Propagation. He had simply noted that pulsing Xenia stop pulsing when the pH drops below 8.3. As soon as he added Kalkwasser to his propagation tanks, the pH rose, and they started pulsing again. It was that simple.

As our testing capabilities have expanded, I have watched good people disappear down rabbit holes chasing exotic causes, only to discover the culprit was something far more fundamental. Something they had stopped checking, because they assumed it had to be something more sophisticated.

Do not overlook the humble pH test

pH is often a simple test that gets overlooked. It can also be alarmingly difficult to identify an actual reading using liquid tests, and digital tests can often give different readings, even when calibrated together. Yet it is quite a biggie.

Fish in a marine environment are under constant physiological siege. Their osmoregulatory systems work relentlessly to maintain balance while surrounded by a liquid that would, given the chance, draw the moisture right out of them. That balance is acutely sensitive to pH. An incorrect pH disrupts the ionic balance across a fish's gills, causing more metabolic energy to be spent just to keep them hydrated.

Proteins and amino acids behave differently at different pH values, each carrying both hydrophilic and hydrophobic portions, one side wanting to remain in solution, the other perpetually trying to escape it. This is precisely why your protein skimmer can seem to have a personality of its own, performing differently at different times of day or under different conditions.

Put simply, pH can affect many things, from the way your fish stay hydrated to how well your protein skimmer works.

KH and magnesium play their own roles in any marine aquarium. On one side, they work to support and stabilise pH, the scaffolding in effect, with pH being the building. Regular examination of the scaffolding is critical, but it is important to take a look at the building itself on occasion, to make sure you are not producing a leaning tower of Pisa.

pH is the building. KH and magnesium are the scaffolding that holds it up.

When knowledge becomes a barrier

> The level of precision we are now able to attain is genuinely exciting, and represents decades of accumulated passion and hard-won experience. But wielded without care, that same knowledge can become a barrier.

Someone new to the hobby reads about picolitre adjustments and trace copper dosing and thinks: I could never do this. And they walk away before they have even started.

This is where pragmatism comes in, not just as a personal philosophy, but as a practical responsibility. If we want this hobby to grow, and I very much do, then the way we share what we know is just as important as what we know. There is a considerable difference between saying "you could try it this way" and "you should do it that way." One opens a door. The other has a tendency to close one.

> One opens a door. The other has a tendency to close one.

A tale of two customers

I have been in this trade long enough to have formed a philosophy, though I did not always know that is what it was. It started, I think, with two customers.



On the marine wall at Shirley Aquatics. Whatever your method, the basics still need doing.

They came into the shop separately, as regulars do, and somehow ended up in conversation with each other. What followed was one of the more spirited debates my shop floor has ever witnessed, and that is saying something. One of them ran an immaculate reef system. Tested for nothing. Added nothing. Did a 20% water change every single week, without fail, and had done for years. The other was meticulous in a very different way, testing for every available parameter, dosing everything, dialling everything in with the dedication of a scientist.

Each was utterly convinced the other's approach was, at best, misguided, and possibly bordering on reckless. I left them to it.

They came back the following week, and something had shifted. They had visited each other's homes. Seen each other's tanks. And both had been stopped in their tracks. Because both aquariums were stunning. Different methods, different philosophies, different relationships with the hobby entirely, and yet the fish were thriving, the corals were growing, and the results were, by any reasonable measure, the same.

That moment, I think, is where my pragmatism began.

There is always more than one way to skin a cat, though I have never understood why that particular expression ever caught on. The point stands. In marine keeping, there are hard and fast rules, yes. Keep an eye on your basics. Do not ignore the horse in favour of chasing zebras. But within those boundaries, the possibilities are remarkable, and the paths to success are far more varied than the

internet would have you believe. "I keep being told different things" is a regular comment I hear in our shop, and it can be difficult to explain: they are all largely true.

I subscribe to the idea that we should all live as perpetual students. Every day is a school day, and the moment you believe you know everything, the world becomes considerably less interesting. My formal marine biology study taught me a great deal. What I have learned since, through years of conversation with customers, suppliers, fellow enthusiasts, and the odd very angry fish, has taught me considerably more.

The distinction I try to hold onto is the one between offering advice and offering a belief. Whilst beliefs are often founded in knowledge and experience, they tend to be very polar and potentially closed off to other beliefs and experiences. Advice, on the other hand, is more open. It leaves room for interpretation, for the person receiving it to make their own choices.

AI, honesty, and the shadow side

Now, I said this piece was about pragmatism, and I have largely stuck to that. But I want to finish with something that, if I am honest, tests mine.

AI is here. Whatever your thoughts on its role in modern life, it is a powerful tool, and I find myself genuinely curious, and cautiously optimistic, about what it might mean for this hobby. Better diagnostic support, more accessible information, faster answers to the sort of questions that used to require either a very knowledgeable friend or a very patient retailer. The possibilities are interesting.

But there is, as ever, a shadow side.

I have already seen it on social media. Polished adverts making extraordinary claims, "crystal clear water in 24 hours," miracle treatments, silver bullet solutions, presented with a confidence and a gloss that AI can now produce very convincingly and very cheaply. The reef-keeping community is, by necessity, a fairly well-informed one. You cannot maintain a reef without engaging seriously with water chemistry, and that rigour tends to make us a harder target for this sort of thing. But harder is not the same as immune, and complacency is always the weak point.

Want to get sharper at telling a genuine product from a slick scam?

We have written a full guide on exactly that. Read: How to spot a fake.

Here is the thing worth remembering, and I think it is rather elegant in a strange way. AI will not lie to you. Ask it a straight question and it will give you a straight answer. Which means that the very tool being used to make these claims look credible can also be used to pull them apart. Screenshot the advert. Screenshot the product claims. Ask an AI whether any of it holds up. You may find the answer illuminating.

The deception, where it exists, does not come from the tool. It comes from the people pulling the trigger. AI in the hands of someone who wants to help you is genuinely useful. In the hands of someone who wants to separate you from your money, it becomes a very sophisticated instrument of that intent. The difference, as always, is not the technology. It is the question of who is using it, and why.

At a time when trust is at an all-time low, and you cannot look at your phone without thinking "is that real or not?", asking the right questions and using the tools we have to get to the truth becomes even more important. Straightforward, unbiased advice, given without agenda, is something our hobby has always needed. Right now, it needs it more than ever. Cutting through the sea of misinformation can only be done with refreshingly open honesty and pragmatism.

And remember, as my Grandad always used to say, "Jack, if it looks too good to be true, it often is." (It is not a typo, he called everyone Jack when making a point.)

The pragmatic summary

The basics worth keeping an eye on:

- Check your specific gravity. It is the first thing to stop being checked, and so often the thing at fault.
- Do not overlook pH. It is humble, easy to skip, and it affects more than you would think.
- Mind your scaffolding. KH and magnesium hold pH steady, so keep an eye on them too.
- Rule out the simple before chasing the exotic. Ask whether you are looking at a horse or a zebra.
- There is more than one way to run a healthy tank. Find the one that suits you and stick to the basics.

Stuck on something?

If you are ever chasing a problem that will not budge, or you just want a second pair of eyes on a parameter, that is exactly the sort of thing we are here for. Pop into the shop, give us a ring on 0121 744 1300, or drop me a line at ri**********@**********co.uk. No pressure, and no sales pitch. Just a straight answer.

Enjoyed this? It first appeared in UltraMarine.

UltraMarine is the UK's marine and reef-keeping magazine, and well worth your time if you keep a reef.

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About the author

Richard Cook is the Managing Director of Shirley Aquatics, a family-run aquatics business that has been serving fishkeepers since 1939. A third-generation aquatic retailer with over 35 years of hands-on experience, Richard is the voice behind The Pragmatic Aquarist, known for his honest, no-nonsense approach to fishkeeping advice that helps customers make confident decisions that work in the real world, not just on paper.