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Selling carbon credits to fund MPAs, Part 2: Could MPAs sell credits based on their fish stocks?

The future for MPA revenue will be challenging. MPAs were chronically underfunded even before the COVID-19 pandemic started. Now — amid COVID-related budget cuts, global recession, the collapse of most tourism, and other factors — many MPAs are in even worse shape. New and more sustainable revenue streams are sorely needed, more than ever.

Could blue carbon credits be one of those new revenue streams? Blue carbon is the capture and storage of carbon in coastal and ocean ecosystems, such as mangroves or seagrasses. Last month, in Part 1 of our coverage of carbon credits, [MPA News profiled two MPA projects](#) that are implementing blue carbon strategies as a source of revenue — the first MPAs to do so. Both projects are restoring mangrove forests and generating credits based on the tons of carbon those new forests have captured and stored. Then they sell those credits to global buyers who want to offset their own carbon emissions. This is a whole new way of monetizing MPAs. According to one of the projects (Tahiry Honko in Madagascar), the current demand for blue carbon credits may be as much as a thousand times greater than current supply.

Of course, not every MPA has coastal habitat suitable for restoring mangroves or seagrass. Could blue carbon still be an option for these other sites, including in offshore areas? Some people say yes: that fish and other marine wildlife are a source of carbon capture and storage as well — through their biomass, feces, deadfall, and other mechanisms. In short: the more fish an ecosystem contains, the more carbon is being captured and stored there. In this sense, MPAs could be viewed as an important management option for conserving, restoring, and enhancing fish carbon services. Theoretically, at least, the financial value of well-managed ‘fish carbon’ could be harnessed via carbon credits to support MPAs, similar to the mangrove projects.

Generating those credits may not be easy, however. For one thing, attempts to quantify fish species’ contributions to carbon capture and storage are just getting started. Without such knowledge, it is impossible to certify whether new carbon capture and storage have occurred among fish at a certain site, or in what amount. This makes it hard to place a market value on that carbon. There’s also the problem that fish tend to move around — between national jurisdictions, and into and out of protected areas — raising questions of who would have the right to market such credits if they were certified, and how these fish would be protected against harvest.

That being said, a recent study by the International Monetary Fund (described later in this article) estimated the value of a single living whale to be US \$2 million, with most of that value deriving from its carbon services. If one whale is theoretically worth that much, effective MPAs with healthy fish populations could be sitting on a potentially substantial source of revenue, tied to conservation.

So, is there some way we could make this idea of fish carbon *actually work*? In this issue we speak with several experts on blue carbon about the possibilities.

Editor’s note: As we noted last month, MPA News recognizes that the concept of enabling polluters to offset their carbon emissions by purchasing carbon credits is controversial. Such a system allows polluters to keep polluting, so offsets are at best a transitional tool toward a low-carbon economy. And there is always a chance that carbon storage projects will fail, releasing their carbon right back to the atmosphere or ocean. A restored mangrove forest, for example, could be chopped down illegally and turned to charcoal — or, in the case of fish carbon, a thriving fish population in a no-take MPA could be poached. Furthermore, in order to produce blue carbon credits, other ecosystem services, like food production, may need to be foregone to some extent, which could lead to difficult tradeoffs.

However, carbon offsets are already part of various existing carbon-trading schemes, and will be included as part of the Paris Agreement's approach to combating climate change. In the context of MPAs, they represent a novel approach to financing, and a way to monetize sites in a manner that rewards making ecosystems healthier and more productive.

The policy questions are tricky but not insurmountable

Steven Lutz (steven.lutz@grida.no) is the Blue Carbon Programme Lead at GRID-Arendal, and is Managing Director of Blue Climate Solutions, a project of The Ocean Foundation. He has authored or co-authored several publications on blue carbon, including [Fish Carbon: Exploring Marine Vertebrate Carbon Services](#)

MPA News: How would you characterize the current state of policy and science on fish carbon?

Steven Lutz: The concept, which we are now calling 'oceanic blue carbon', is beginning to be introduced into policy discussions, and there are some promising first steps:

- In 2016, at the annual meeting of the International Whaling Commission (IWC), whale carbon was introduced in support of a proposed Southern Ocean Whale Sanctuary, and a [resolution was passed](#) by 36 countries asking the IWC's Scientific Committee to advance the understanding of how whale conservation may help mitigate climate change.
- In 2017, Blue Climate Solutions and partners organized an [Oceanic Blue Carbon Voluntary Commitment](#), which was endorsed by over 100 members of the scientific community and civil society. The UN Convention on the Conservation of Migratory Species also adopted a [resolution acknowledging whale carbon](#).
- At the 2018 meeting of the IWC, whale carbon was introduced in support of a proposed South Atlantic Whale Sanctuary, and 41 nations [endorsed two resolutions](#) that highlighted the potential role whales play in retaining carbon in the ocean and helping to reduce the effects of climate change. One resolution encouraged parties to "integrate the value of cetaceans' ecological roles into local, regional and global organisations on biodiversity and environment, including climate change and conservation policies."
- In 2019, GRID-Arendal and Blue Climate Solutions undertook an oceanic blue carbon policy assessment for the United Arab Emirates, which will be released shortly, and in December 2019, whale carbon was presented at a [side event at COP25](#) of the UN Framework Convention on Climate Change. The concept has also been [advanced in support of high seas MPAs](#).
- The concept was [presented last month to the Group of Twenty \(G20\)](#)
- The recent interest shown by the International Monetary Fund in whale carbon has been a phenomenal help in attracting attention to the concept, and recognition is now growing that there are two types of blue carbon — both coastal and oceanic.

In terms of the science, much more research is needed to support robust, science-based oceanic blue carbon policy. Our knowledge around this topic is still nascent. Since 2016, there have been some publications that discuss different parts of the marine vertebrate carbon mechanisms and its potential relation to MPAs [see box "More reading on oceanic blue carbon" at the end of this article], but there are still no serious coordinated research efforts.

When we last talked in 2016, you said harnessing the financial value of oceanic blue carbon could benefit MPAs. If an MPA practitioner came to you and asked what steps they could take to start monetizing their fish carbon, what advice would you give them?

Lutz: To answer that question, we first need a scientific methodology for valuing oceanic blue carbon in MPAs. We need to connect the economists with marine scientists and ocean carbon modelers. Once such a valuation exists, then I imagine a financial model similar to the one used by the [mangrove restoration projects described in your last issue](#) could be possible. In other words, an MPA would use traditional conservation funds to support project development (including certification of carbon credits), and then sell the credits on the Voluntary Carbon Market to support the project's long-term sustainability.

Most MPAs are not well-funded and, as a result, are not particularly effective. This could actually be an advantage in terms of oceanic blue carbon: it may give us a good case for evidencing the *additionality potential* of blue carbon offsetting in MPAs. Additionality is a core concept in carbon offsets: you need to be able to demonstrate that the carbon captured and stored through particular management activities would in fact be *additional* to what would have been captured and stored otherwise (i.e., without the sale of carbon credits).

For this reason, MPAs that are either new — especially in areas where degradation or unsustainable fishing practices occur — or poorly funded and ineffective would have an easier time meeting the additionality requirement. Things get a bit trickier for MPAs that are already successfully protecting their coastal and marine ecosystems: they would have to demonstrate that conservation-based carbon sequestration would not occur without the additional finances from carbon offsetting.

It should also be noted that carbon offsetting is just one method for implementing blue carbon. For example, countries could include MPA blue carbon in their national greenhouse gas accounting, which is currently being explored by the [UAE, Kenya](#), and other countries. In any case, developing a total economic valuation of all ecosystem benefits generated by an MPA —

including carbon, biodiversity, food security, tourism, and more — could help justify additional resources being directed toward the sustainable management of MPAs.

How would MPAs handle the fact that fish tend to move, from one straddling jurisdiction to another?

Lutz: There is no doubt that transient fish populations could be tricky to manage in terms of jurisdiction. Who would own the carbon? And migration over time due to climate change may further complicate the matter. To some extent, these issues could be eased with 'mobile MPAs' and other dynamic, area-based management tools to protect biodiversity in a changing world. If an MPA's boundaries follow the fish, that simplifies the carbon jurisdiction question.

Overall, I don't think this issue is insurmountable. Currently, marine life is a commodity for extraction, which faces jurisdictional challenges of its own. Oceanic blue carbon proposes an alternative commodity for marine life, one that supports climate action. Once we can put a carbon value on keeping fish in the ocean, there will be an economic incentive for answering the tricky policy issues. At that point the question becomes, what sort of a market could there be for oceanic blue carbon offsets? Would people be willing to pay to save the whales and the planet at the same time?

Fish carbon is something to consider

Chris Stephenson (info@planvivofoundation.org) is Head of Operations for Plan Vivo Foundation, based in the UK. Plan Vivo is a third-party verifier of carbon credits, and among just a few verifiers that offer blue carbon methodologies, namely for mangroves and seagrass. Plan Vivo verifies the carbon credits generated by the mangrove restoration projects in Kenya and Madagascar.

MPA News: No fish carbon projects have been verified yet, and there is no methodology for doing so at this time. Would Plan Vivo consider certifying the credits from a fish carbon project?

Chris Stephenson: This would be something to consider if/when a project concept was submitted to Plan Vivo Foundation. We currently allow for innovative methodologies, provided that:

- The methodology is considered scientifically robust and built on accepted, peer-reviewed models;
 - The project proponent can justify any assumptions made and uncertainties can be minimized to acceptable levels
 - The 'land' tenure and carbon rights are clearly defined and in line with a participatory, bottom-up approach
 - The project delivers benefits to local people in keeping with the ethos of the Plan Vivo Standard, generally located in developing or under-resourced countries and regions, that face challenges related to natural resource management, environmental degradation, or similar.
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Valuation has to be credible, reliable, and relatable

Ralph Chami (rchami@imf.org) is an Assistant Director for the Institute for Capacity Development at the International Monetary Fund. In 2019, he and other economists published a report that estimated the value of the average great whale to be more than US \$2 million, based primarily on carbon sequestration services, as well as other ecosystem benefits. In 2020, the same team estimated the value of great whales in Brazil's waters at \$82 billion. The current global stock of great whales would, by these calculations, be over \$1 trillion.

MPA News: Your research on the value of great whales, and particularly their carbon services, is among the first real valuations of oceanic blue carbon. If an MPA manager came to you and asked what steps they could take to start monetizing their whale carbon, what advice would you give them?

Ralph Chami: Valuation of marine ecosystem benefits is key to effective protection of MPAs. That valuation, however, has to be credible, reliable, and relatable. By *relatable*, I mean the natural asset that's being valued has to be in people's psyche. For example, we could have focused instead on the value of phytoplankton...but most people cannot relate to phytoplankton. In contrast, great whales capture people's imagination, which helps us drive the message that a living nature is valuable.

Furthermore, valuation alone of ecosystem benefits is not enough. Policy is needed, too. Once a credible valuation is in place, policy can be designed to protect the ecosystems. In turn, that policy is accompanied by a system of penalties and incentives that are based on the valuation. The penalties signal government commitment to protection and conservation, while incentives attract the private sector and engender local ownership.

Then, once valuation and policy are in place, markets can be developed. The private sector can partner with the public sector to bring in much needed funding for MPAs to protect and enhance the ecosystems, generate employment for local communities, and create an ocean economy that helps to diversify the greater economy, as well as ensure sustainable and inclusive economic growth. My team is currently working with Fundación MERI in Chile to explore applying these ideas to that country's marine environment [see box below].

What do you see as the main challenges faced by MPAs in generating revenue from whale carbon?

Chami: The first challenge would be enacting laws that recognize whales as an asset that has rights and obligations. Once that is done, and valuation is in place, markets can be developed around it.

Are you also valuing other types of blue carbon, in addition to whale carbon?

Chami: We also engaged in evaluating saltmarshes and some non-cetacean marine life. (In addition, on land, we evaluated elephants.) Our broader objective is to showcase the net benefits of a living ocean that is a renewable resource, rather than an ocean that is viewed as a depletable resource. Currently, fish has value only if it is dead and served on a plate. We have made the point that a living whale is far more valuable, at \$2 million, than a dead one valued at \$40,000 for its meat.

Chile and whale carbon

This year, Fundación MERI and Chile's environment ministry launched [The Blue BOAT Initiative](#), which is installing an early warning system in Chilean waters to prevent ship strikes of whales. Although similar monitoring systems exist elsewhere in the world, Chile may be unique in citing the value of whales' carbon services as a primary reason to protect them. The initiative is informed by the whale valuation work of Ralph Chami and colleagues.

"The unprecedented aspect of this project is the possibility of changing the focus of public policy, and establishing not only an environmental value but also a social and economic value to the death or stranding of whales, and the associated ecosystemic damage," says biologist Sonia Español-Jiménez of MERI. "We believe the economic valuation of whales in Chile is a step towards valuing all marine ecosystem services, in any country."

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Fish carbon won't be a silver bullet for MPA financing

Dorothee Herr (dorothee.herr@iucn.org) is Manager for Oceans and Climate Change at the Global Marine and Polar Programme of IUCN. She has authored and co-authored multiple publications on blue carbon. She also manages the [Blue Natural Capital Financing Facility](#), which supports the development of investable projects to protect and restore natural ecosystems to better support climate change adaptation and mitigation efforts.

MPA News: Within current policy frameworks, what are the main challenges facing potential implementation of fish carbon, including as a revenue source for MPAs?

Dorothee Herr: We need to start with the United Nations Framework Convention on Climate Change (UNFCCC), which unites the world to reduce greenhouse gas (GHG) emissions. Parties recognize various means to do so across a suite of sectors — from energy, to transport, to land-use practices including forestry and wetland conservation and restoration. Parties are expected to report GHG sinks and sources from those actions within their national jurisdiction, or based on agreed 'exchanges' (trading/offsetting) with other countries, following approved methodologies and guidelines. Especially in the context of using nature for claiming emission reductions, it needs to be clear that these are additional, long-term reductions based on positive human interaction with and management of the ecosystem in question.

If our intent is to ensure that the world maintains a global, coherent, and harmonized reporting and accountability system, which results in swift and meaningful net emissions reductions, then any new activity or sector ought to be accepted as part of the UNFCCC processes. We cannot rely solely on voluntary markets — which are less coherent and less harmonized — for the world to get where it needs to be.

Carbon that is sequestered and/or released due to human management of marine vertebrates does not feature as an agreed activity or sector within the current UNFCCC. Moreover, there are indeed a few inherent barriers. To illustrate why certain sectors, activities, or ecosystems feature in the UNFCCC and others not, I take the following paragraph from the [Howard et al. paper from 2017](#):

"Additional information will be required to inform the development or expansion of policy to include the carbon mitigation benefits found in marine ecosystems. For example, understanding community tenure rights, rights of use, and governance for an ecosystem or ecosystem component — as well as identifying which individuals, institutions, or governments are responsible for management, and who stands to gain from resulting climate benefits — are all critical for proper implementation of climate-related policies. Likewise, it is important to know who would be sanctioned for actions that result in carbon being released (e.g., deforestation of mangroves) and whether the ecosystem can be managed to secure existing carbon stocks."

So leaving aside questions on whether fish and whales are indeed a significant, long-term carbon sink or not (What is their carbon sequestration rate? What are their current carbon stocks?), there are other issues such as:

1. Straddling jurisdiction – which countries can claim the carbon from new fish/whale populations?
2. Which methodologies should be used for the carbon accounting?
3. Who would pay for the new conservation as well as the monitoring measures?
4. How would any new set-up be aligned with the existing international fisheries agreements and the prevalence of illegal/unreported/unregulated fisheries?

How challenging would it be for the UNFCCC to be altered to include fish carbon as part of its processes?

Herr: To add a marine vertebrates sector or activity to the UNFCCC, all countries would have to agree to do so, and many technical, jurisdictional, and political questions would need to be resolved. Even under a favorable political climate, this could take years. In the current political climate, this would be even more difficult, and certainly by no means quick. I'm not sure we have the luxury of time. The news on tipping points that are already becoming apparent — like the rapid melting of ice sheets in Antarctica or Greenland — is heartbreaking and real.

Are there any specific scenarios in which you could imagine fish carbon being monetized today? For example, is there anything stopping an MPA from contracting privately with a local company to offset the company's emissions via the MPA's fish carbon?

Herr: We need people thinking outside the box, finding solutions beyond the immediately possible. I don't think there is anything stopping anyone from running their own fish or whale carbon crediting scheme. However, if the scheme is not embedded into any national or international scheme, I would doubt the credibility of the effort and the 'big picture' impact in relation to global climate mitigation. So I have trouble seeing how fish carbon can be monetized anytime soon, especially with all relevant safeguards, both from an environmental as well as social point of view.

This of course doesn't resolve the need to find ways to fund marine protected areas, which remains a major challenge. There has never been a silver bullet for MPA financing, and fish carbon won't be one either.

With efforts like the Blue Natural Capital Financing Facility, we are trying to identify and support project developers and start-ups on their path to becoming bankable, including one on MPAs. Nevertheless it is certainly a steep and challenging road to get there. We need to focus on trying to set the right priorities for swift and real nature conservation *and* climate action.

More reading on oceanic blue carbon

Steven Lutz recommends the following sources for more information on oceanic blue carbon and its potential links to fisheries policy and MPAs:

- Roberts, C. et al. (2017). Marine reserves can mitigate and promote adaptation to climate change *Proceedings of the National Academy of Sciences*.
- Le Moigne, F.A.C. (2019). Pathways of Organic Carbon Downward Transport by the Oceanic Biological Carbon Pump *Frontiers in Marine Science*.
- Martin, A. et al. (2020). The oceans' twilight zone must be studied now, before it is too late *Nature*.
- Oceanic Blue Carbon Story Map (2018). Produced by GRID-Arendal and Blue Climate Solutions.
- Chami, R. et al. (2020). On Valuing Nature-Based Solutions to Climate Change: A Framework with Application to Elephants and Whales. Economic Research Initiatives at Duke (ERID) Working Paper No. 297.

Blue carbon as a consideration in project design

Nicolas Pascal (npascal@blue-finance.org) is Executive Director and Co-Founder of Blue finance, which partners with governments, stakeholders, donors, and investors to develop joint partnerships and blended finance solutions for the collaborative management of MPAs. Blue finance is active in the Philippines, among other nations, and is considering the generation of blue carbon credits from mangroves in two of its MPA projects there. The credits would be part of revenue diversification for the sites.

MPA News: You provide an interesting case because you are currently considering whether or not to pursue blue carbon as a strategy at these two MPAs. What are the main factors you are considering?

Nicolas Pascal: One of the main challenges is the identification of mangrove sites with the best potential. Exacting requirements drastically reduce the number of locations where viable carbon credit mechanisms can be established. All of our projects go through a feasibility scoring matrix based on over 30 criteria (e.g, mangrove area, tenure, governance, threats, ongoing programmes, etc.). This matrix allows us to identify where trade-offs in the decision process can be made — for example, a site with a reduced mangrove area but a clear tenure and governance. Clear tenure and governance cover such things as property rights, user access rights, and, if protected, who is in charge of managing the area.

MPA News: How many carbon credits would you aim to produce in the projects?

Pascal: As a general rule, we focus on projects with the potential for at least 60,000 metric tons of carbon credits per year.

This would be approximately 100 hectares of mangroves under management.

MPA News: How will you choose which third-party verifier to certify the credits?

Pascal: We have the feeling the verification sector is still in the initial stages for blue carbon certification, and relevant standards are still very recent (e.g., Verra's Verified Carbon Standard). We will follow the preferences of potential buyers of the offsets.

MPA News: Do you believe that carbon credits — generated from mangroves or even from fish and whales — will eventually become a significant source of financial support for MPAs?

Pascal: I believe carbon credits are an interesting source of income for MPAs with mangroves under threat. It allows us to diversify the MPA revenue mechanisms and especially to provide alternatives to the classic tourism user fees. However, the criteria for a successful carbon credit project are strict and the potential to become a major source of income are limited.

Regarding other sources of carbon, we have to keep in mind the additionality factor. Carbon credits are paid only if we can prove the activities financed by the carbon credit (whether restoration or conservation) have avoided the release of carbon stock into the atmosphere. That is already a challenge for mangroves and seagrass to bring clear proof of additionality. This aspect would have to be addressed for fish or whales.

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