

**Global Coral Reef Strategy
The Nature Conservancy
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Prepared by: Stephanie Wear, Director of Coral Reef Conservation



Executive Summary

Coral reefs are under global siege from a variety of human-induced threats. These stressors are increasing in step with rising human population. Even with the collective efforts of many to protect reefs, we are not able to keep pace with the rising tides of anthropogenic threats. In fact, we have fallen behind. The rapid increase in threats to coral reefs globally became extremely clear in 2011, with the publication of *Reefs at Risk Revisited*. The authors concluded that the threat level had increased by 30% between 1998 and 2011. What the report did not say, but what is clear is that our current strategies, even if expanded and improved, will not be enough to get ahead of these increasing threats. Given this glaring need for conservation improvement, The Nature Conservancy (TNC) must develop additional and larger-scale strategies that can reverse as opposed to simply slow the trajectory of reef decline.

While our current efforts are vitally important, it is clear that they are not sufficient to comprehensively address the threats that reefs face. In short, new approaches are needed to tackle coral reef degradation at a scale commensurate with the global threats they face. Fortifying our current efforts is key - but not wholly sufficient to bend the trend of coral reef health. We aim to substantially elevate TNC's impact on coral reef conservation in the next 5 years through enhancing our existing work and taking on new tactics aimed at addressing global drivers of local threats.

In the past year, we have assessed ways we can improve and further leverage our existing work with emphasis on finding potential efficiencies and ways of transferring knowledge. Our work also has substantial redundancies and gaps that must be addressed if we are to address accelerating threats to these ecosystems.

A survey of staff representing all of our coral geographies was conducted in 2012 and based on our findings, (expanded discussion in Section 1) we recommend that TNC implement the following to make our current efforts more effective:

1. Conservation portfolio evaluations with the potential to lead to resource reallocation;
2. Thoughtful consideration of what measures are really needed and potential monitoring redesign;
3. The implementation of a TNC community of practice & reef-focused Coda fellowship program;
4. Threat gap analysis to identify areas where new/additional strategy development is needed;
5. Collaborative fundraising between global and field programs.

Through the Coral Solution Series, we worked to identify new opportunities and specific strategies that TNC is well suited to implement that will advance our work and move the needle on reversing the current trend of decline. These workshop

series brought together about 40 people that represented a diversity of perspectives and experiences from both inside and outside of TNC. The process was iterative with each group building on the work of the last and resulted in three thematic areas for TNC to pursue further and integrate into our existing program of work.

The themes are as follows:

1. A New Narrative
2. Improving Water Quality
3. Food Security through Sustainable Fishing

Each of these were further articulated during the final stage of the Coral Solution Series with details in Section 2.

Section 1: Enhancing Existing Work

Before developing new strategies, it was important to assess the status of TNC's current efforts. This information provides an understanding of what we should build on and gaps we need to address. To accomplish this goal we conducted a global survey across all our programs conducting coral reef conservation. Below, we provide short overview of current TNC coral reef conservation efforts and provide a succinct summary of the status of those efforts. Over the last two decades, TNC's efforts in coral conservation have grown dramatically and represent collectively one of the world's largest non-government organization (NGO) investments in coral reef conservation.

Current Strategies in TNC Coral Reef Conservation:

The Nature Conservancy has been engaged in coral reef conservation since the early 1990s, with our early work beginning in Palau and Indonesia, quickly followed by work in several Caribbean countries. Today we work in 24 coral reef countries, covering 40% of the world's coral reefs, including the epicenter of coral reef biodiversity, the Coral Triangle. Our work began with a focus at the local scale, working with local fishers and other stakeholders. We helped to build new local NGOs, and worked with local and national governments to improve regulations. Our traditional focus has been on the development and management of protected areas and protected area networks. These efforts have been recently amplified by regional challenges, collaborations, and learning exchanges.

In addition to more traditional conservation strategies, the Conservancy has also developed a significant Acropora coral restoration program with origins in the Florida program, which has now expanded to multiple countries in the Caribbean region. This work is quickly becoming a fundamental component of a more holistic approach to boosting coral populations of reef-building acroporids (elkhorn and staghorn corals), laying the foundation for even more aggressive coral reef restoration approaches in the near future both within the Caribbean and on a global scale.

In addition to our local and regional work, TNC has had since 2002 a significant global program that focuses on incorporating climate change and the impacts of warming seas into our management strategies. The foundation for this work was the first edition of the Reef Resilience Toolkit, a resource for managers and scientists to help navigate this new challenge facing reefs. Since the first edition in 2003, the Reef Resilience Toolkit has evolved and has become the go-to resource for coral reef managers (in 2012, the site had over 100,000 unique visitors). It is comprised of a suite of resources, guidelines, and case studies on the most relevant reef management topics facing managers today. The Toolkit is updated annually to reflect a rapidly developing body of literature focused on coral reef management and resilience and is the foundation of the *Reef Resilience Program*, which has been an ongoing capacity building program since 2005.

The Reef Resilience Program consists of a ‘training of trainer’ curriculum, online courses, learning exchanges, and webinars that aim to provide critical skills and information to coral reef managers globally. To date, the program has trained over 800 people in person and enrolled more than 800 others in online courses from over 75 countries. This level of engagement and geographic diversity gives TNC greater reach than any other organization. The program has evolved to become our main platform for disseminating lessons learned, case studies, best practices, and the most current science related to coral reef management. This work is characterized by strong partnerships with both large and small international NGOs as well as the two largest government-based coral reef management programs: Australia’s Great Barrier Reef Marine Park Authority (GBRMPA) and the USA’s NOAA Coral Reef Conservation Program (CRCP).

Building on our on-the-ground oriented work, the Conservancy has also actively engaged in various policy fora over the last decade, working to influence coral reef conservation as a global priority as well as specifically advocate for particular approaches (e.g., resilience-based management, MPA networks, etc.). We expect this policy work to expand and accelerate as part of our future work.

Status of Current Strategies in TNC Coral Conservation

In 2012, we developed and conducted a survey applied at 37 sites to better understand the status of our current strategies. Specifically, for each of our field programs, we surveyed site-specific threats, strategies, activities, priorities, and challenges. We analyzed the responses, summarized the data, and provided recommendations in an expanded document that is available as an appendix. The essential findings and recommendations are listed here.

Key Findings:

Six critical findings emerged that merit further discussion and action.

Our key findings were:

1. There is some mismatch between allocation of resources and what are identified as top threats to corals;
2. Watershed management strategies are widely under utilized relative to the importance of water-quality threats;
3. Some climate-related threats are largely ignored (e.g., sea level rise);
4. Investment in multiple monitoring programs is common, creating inefficiencies and a high likelihood of redundancy;
5. Our distribution of strategy implementation is inconsistent within and across geographies creating potential inefficiencies;
6. Restoration is an emerging strategy on the horizon for all geographies.

Challenges

Program managers were asked to identify the challenges for each strategy employed. The top four most commonly sited challenges across the four main strategies identified out of 10 possible challenges include:

1. Inadequate funding or financial support
2. Lacking government support
3. Low TNC capacity
4. Low local capacity

Recommendations

This survey was useful in highlighting some clear trends across the regions regarding the implementation of conservation strategies and in illuminating a path to a more effective global coral-reef program. It is clear that there is a tremendous need for a knowledge-management system and that such a system could facilitate learning and expansion of strategic application within and across regions. This survey was fairly simplistic in terms of the information we collected, but the results it produced provide evidence that highlights the need to reallocate resources. Therefore, we need a more quantitative assessment to get at important questions – such as how field programs are making decisions to apply a particular strategy in one location. Findings of this survey also pointed out that we need a low-impact portfolio evaluation process to both assess the allocation of resources and draw out lessons learned and best practices, ultimately identifying clear areas of leadership both internally and externally. These portfolio evaluations should be on a 5-year cycle. While our global capacity building efforts have focused on bringing managers together, sharing experiences across political boundaries, and providing training on different topics – this has not been targeted towards our Conservancy staff; rather it has been focused externally, with Conservancy staff benefitting only at times. Ensuring that our field staff are well positioned and trained to be effective will, in turn, improve the experience and lessons learned that we export beyond TNC. The following recommendations are provided here based on the results of this survey:

1. **Conservation Portfolio Evaluations:** Develop and implement conservation portfolio evaluations for each geography that would gather best practices, identify areas of strength and leadership, and conduct analyses of resource

allocation that would inform an evaluation that could be used to make programmatic adjustments and track progress over time. Ideally, this would be low impact and performed remotely with the incentive being a rapid report back on results and recommendations. These evaluations could lead to resource reallocations to ensure program goals are compatible with the level of threat and local need.

2. **TNC Community of Practice & Fellowship Program:** Our current work lacks cohesion between geographies and across regions. Given the extent of our work, a gathering of TNC staff (every other year) to share best practices and identify leaders and experts on key topics would increase efficiencies, facilitate collaborations, and increase the power of our work by bringing together the collective, making the sum greater than its parts. This community of practice would be enhanced by existing networks both within the Reef Resilience Network and TNC's CONNECT community. In each geography, there is clear leadership and expertise on particular conservation strategies (e.g., restoration in the Caribbean, capacity building in Micronesia, MPA networks in Indonesia, etc.). In line with broader expert exchanges such as the Coda Fellows Program, a coral reef conservation fellows program that is part of the Coda Fellows Program would provide opportunities for staff to spend extended time (1 to 3 months) in other regions both to share their expertise and to learn from the host site would greatly benefit both sites and the individuals involved. Such a program could be implemented via a collaboration between the Coda Fellows Program and the Global Marine Team. The program would help build staff leadership and raise the profile of both successes and failures through reporting findings of each fellowship to the TNC coral reef community.
3. **Threat Gap Analysis:** Identify expertise and threat gaps that are critical to our success. This can be done through conservation portfolio evaluations and additional surveys. This knowledge can inform priorities for both regional and global teams that are working to address critical needs (e.g., watershed management strategies).
4. **Measures Program:** Monitoring for the sake of monitoring is epidemic in coral reef management. So many places are collecting data, never to be used, or data that are not conducive to regional or global scale analyses. As we analyze our own monitoring programs and in turn, work with partners to influence their methods, we must be promoting an 'evidence-based management' approach. Monitoring data are meant to be used to inform decision-making – yet this rarely happens. Not only will such an approach help inform good management decisions, it will also increase efficiencies by reducing the number of indicators included in the monitoring protocol (i.e., eliminating indicators that don't provide actionable results). In many cases there is weak support from national and local governments for monitoring activities. However, adopting an evidence-based management approach

where politicians can see clearly the results of the monitoring and how it is being used to make decisions – could potentially increase support and funding for critical monitoring programs. We also need to build on existing measures efforts to standardize where possible and expand biological monitoring to include social outcomes to our work. This will enable us to demonstrate the social value of coral reef conservation.

5. **Collaborative Funding:** Historically TNC coral reef fundraising has been done on a country-by-country or regional basis. However, recently we have seen great benefits in bringing multiple geographies together in combination with the Global Marine Team to submit joint proposals. Coral reef conservation provides a great opportunity for this given the shared threats and local challenges shared among our program sites. Having illustrative and compelling measures built into such collaborations will add to the appeal for donor audiences. A successful example is the NOAA Coral Reef Conservation Program partnership. This is a 4-year, \$7.2 million partnership that, by design, requires TNC programs to work together to assemble a coherent vision for coral reef conservation across multiple geographies. Participation in this partnership has resulted in new collaborations across sites, sharing of methodologies and advice amongst grantees, and greater clarity in terms of the impact of our work. Joint proposals can be a very effective way to focus programmatic vision and leverage larger amounts of funding over time.

Section 2: New Tactics

Although there has been great effort to protect coral reefs around the globe, the Conservancy recognizes that the current array of on-the-ground conservation projects at a limited number of coral reef sites is not sufficient to ensure that coral reefs are able to persist and flourish over time. Reefs are still declining, despite all the effort that has been made to date. Achieving a lasting and measurable conservation impact will require the support and involvement of a broader range of constituents, in addition to the wide range of coral managers and policy-makers from governments, institutions, and NGOs globally that are currently engaged in reef conservation.

The development of an expanded and globally-cohesive strategy for coral reef conservation does not diminish the value and importance of our current conservation work. The work that we do to build resilience at the local scale, restore degraded habitats, and engage communities as stewards of their resources provides the necessary foundation for lasting, large-scale conservation of coral reefs. However, in order to truly protect the remaining coral reef in the world (and not just slow the decline), additional bold actions are necessary – we need a strategy to ‘win’ that can be measured by the extent and condition of the world’s coral reefs as well as the benefits they provide to human communities.

Coral Reef Solution Series

To develop new strategies, we initiated an iterative process that brought together a diverse group of people (see Appendix A) that helped to identify critical problems for coral reefs that TNC is well positioned to help solve. In the three-part series we defined the problem, identified high-leverage opportunities, identified solutions, and developed preliminary implementation plans including identification of potential collaborators and institutions. Through the process we identified three global-scale approaches and developed preliminary implementation plans to put these new ideas into motion. The three key areas for opportunity are:

1. A New Narrative
2. Improving Water Quality
3. Food Security through Sustainable Fishing

A detailed description of each area of work is provided below. Further supporting documentation is available at: ([link to CONNECT documents](#)).

A New Narrative

Coral reefs are facing tremendous challenges over the next few decades and few understand why that matters. Long portrayed as a habitat that should inspire awe for its sheer beauty and impress because of the mindboggling number of species of fish, invertebrates, and plants - reefs seem only superficially valuable to the average person. We have gotten the message wrong and this is having serious consequences for reefs. The story is even worse now because newspapers are peppered with stories of doom and gloom – of a world without reefs by the end of the century or sooner. These messages leave people paralyzed and the response is to do little or nothing because – why bother?

The narrative for reefs must change, and the change must be viral. It can't just be The Nature Conservancy talking about reefs differently – everyone that talks about reefs, that is working to protect them, that benefits from them – needs to be telling the real story about reefs. This is a story of one of the most important habitats in the ocean – of a habitat that has proven to show remarkable resilience and ability to recover - of a habitat that provides hundreds of millions of people with food, jobs, and coastal security – of a habitat that sources life-saving medicines to people globally. The message is that coral reefs matter to everyone. In identifying the need for a new narrative, we are not saying to just change the messaging – we are talking about changing the way people talk, think about, and take action on behalf of coral reefs.

We envision a multi-layered approach that includes working with industry professionals to develop clear messaging, employing digital and mobile technology to drive and expand the coral reef dialogue, work with coral reef organizations to form a united voice on behalf of coral reefs, and ultimately work to shift the understanding and behaviors of both the public and decision-makers as to why coral reefs matter to everyone.

Improving Water Quality

Coral reefs are living ecosystems that thrive in warm, clear, low nutrient waters around the world. Coastal communities can influence the condition of these waters in a number of ways, and by extension the health of reefs. One of the ubiquitous ways we influence coastal waters is through discharge of sewage and associated wastewater into coastal waters.

Only 10% of wastewater in developing countries is treated, and the World Bank notes that “rapid urbanization and population growth, expansion of piped water services, and increased per capita water use all lead to greater volumes of wastewater discharge. Untreated, this discharge can harm biodiversity in rivers, pollute lakes and coastal waters, and affect public health.” Indeed, even with secondary treatment, human diseases have been found in Florida’s coastal waters (Carsey et al. 2010; NOAA Tech Report; Sutherland et al. 2012 PLOS) and infection of ESA listed corals by some human pathogens has been documented.

Coastal pollution is costly. The global cost of coastal water pollution is \$12.8B (IFREMER, 2006). For perspective, this cost exceeds by 30% the annual value of reef-related ecotourism (\$9B annually). Clearly, reducing the impacts of untreated or poorly treated wastewater will improve the well-being of people in coastal communities and support development of coastal economies.

The World Bank and other multilateral organizations are supporting investments intended to improve sanitation, hygiene, and wastewater treatment and management in developing countries around the world. To date, however, the principle objective of wastewater treatment has been the protection of human health. While this is a critically important objective, some wastewater treatment infrastructure that protects human health may not provide adequate protection the environment. It is critical that these investments are made with ecosystem benefits in mind, in addition to human health. Technologies exist to provide adequate protection for both human health and ecosystem health, and should play a key part in conserving and restoring coral reefs globally.

We envision a diverse approach to address the problem of wastewater. This should include partnerships with engineering firms that produce the technology to treat water, with funders focused on adaptation funding to ensure that best technologies are built into future infrastructure plans. We should also partner with corporate leaders looking to improve business practice and their bottom line and with innovators looking to solve the toilet problem in developing countries – all resulting in better water quality for people and coral reefs.

Food Security through Sustainable Fishing: (Fish Smarter, Feed Tomorrow Too)

In the early days of coral reef conservation at TNC, many of the projects focused specifically on fisheries or included fishers in the work directly. Even before the organization recognized fisheries issues as a part of our work, we were doing fisheries work in our tropical geographies because food and job security were what

resonated in the communities where we worked - it was what made reef conservation relevant to communities. Even in our reef resilience training, reef managers would show up wanting to talk and learn about fisheries issues. Recognizing fisheries as one of the biggest threat to reef health and at the same time understanding the importance of reef fisheries to food and jobs – we know that we need to take a more proactive approach to reef fisheries conservation and management.

Historically, there haven't been great solutions to strike a balance but recently there have been some promising developments in solving the problems faced by looking to the seafood supply chain, understanding the human behaviors that compromise the fishery, and looking to solve the problems through facilitating a more entrepreneurial approach as opposed to one focused on the old model of protected areas, regulations, monitoring, and poor enforcement.

Our vision is that global fisheries are managed in a way that results in viable local fisheries, stable supplies of seafood, and ecosystem conservation. To achieve this vision in a way that adds value to the existing Fisheries Strategy and leads to the recovery of reefs on a global scale we want to focus on the supply of sustainably caught seafood that contributes to local food security, on new business opportunities within the supply chain and the policy opportunities on a regional scale to enable investment in sustainable fisheries and food security.

We envision a series of initiatives that result in better-managed fisheries where coral reef conservation is important and a co-benefit contributes to food security. To do so we will support and incubate solutions for food security and coral reef conservation, create investment opportunities for sustainable fisheries and seafood supply chain, and leverage TNC's unique multi-country regional focus to amplify our fisheries policy work.

Section 3: Next Steps

Implementation of new, expanded strategies for coral reef conservation is both daunting and necessary. Fortunately, a number of enabling conditions exist that can help the Conservancy further distinguish itself as a leader in coral reef conservation:

- 1) TNC's new Global Challenges/Global Solutions framework will enable more of the organization's strengths and resources to be brought to bear on reef issues – for example, *at least* three of the Global Priorities have the potential to directly address threats to coral reefs or to bring new management solutions to the forefront for the protection of coral reefs (Integrated Ocean Management, Sustainable Fisheries, Climate & Disaster Risk Reduction). Through each of these strategies and their implementation teams, various parts of the organization have a tremendous role to play: the Corporate Practices program can help to engage the wastewater technology companies (e.g., Siemens, CH2MHILL); External Affairs can help direct funding for

sewage infrastructure to ensure that tertiary treatment is the norm (removing more nutrients and pathogens) and that systems are designed not just to meet human health needs, but reef health needs as well; Strategic Communications can help to reshape the narrative and engage both the public and other conservation organizations, and we can build on the foundation provided by TNC's long-standing Reef Resilience Program.

- 2) TNC is a partner in the Global Partnership for Oceans, which aims to address three main sources of stress to the world's oceans: unsustainable fishing, habitat loss and degradation, and pollution. Implementation plans are being crafted for each of these three focus areas, so elevating coral reefs through each of the Partnership's themes could bring new resources and political will to bear on reef conservation and improved management. TNC staff have the opportunity to influence these plans this summer in advance of a Global Ocean Action Summit in The Hague, in September 2013.

Each of the newly identified strategies is further articulated in separate documents (insert link here) and will be incorporated into the GCGS framework as appropriate. Further consultation with field programs and partners is necessary to ensure strong collaborations both inside and outside of TNC. During FY14, Global Marine staff will be working with field programs, specifically through the Integrated Oceans Management advisory group, to identify ways to incorporate the recommendations from the coral reef program survey. There will be an event at the Marine Aggregation in February 2014 that focuses on the expansion of TNC's coral reef work as well as initiating the learning activities recommended. TNC's work to protect coral reefs will continue to evolve and expand to meet the need with greater focus on identifying opportunities for that benefit both people and coral reefs. Feedback on this draft strategy is welcomed and encouraged. As this work evolves, updates will be available on the CONNECT site as well as through webinar updates.

Appendix A: Participants in Coral Reef Solution Series 2013

Name	Organization
Kacky Andrews	TNC/North America
Mike Beck	TNC/Global Marine
Sarita Bhargava	TNC/Marketing
*Kelvy Bird	Facilitator, The Value Web
*Rob Brumbaugh	TNC/Global Marine
*James Byrne	TNC/Caribbean
Rebecca Cerroni	Blue Oceans Horizon
Dan Chung	TNC Trustee/CEO of Freg Alger Management
Chuck Cook	TNC/California
Cheryl Dahle	Future of Fish
Kate Gardiner	Digital Strategy Consultant
Michael Goodman	Facilitator, Applied Systems Thinking
Lynne Hale	TNC/Global Marine
Misty Herrin	TNC/Africa
*Peter Kareiva	TNC/Central Science
Bramble Klipple	TNC/Philanthropy
Nadine Marshall	CSIRO-Australia
*Paul Marshall	Great Barrier Reef Marine Park Authority
Tom McCann	TNC/Marketing
Joe McCarron	Facilitator, Reos Partners
*Gerald Miles	TNC/Asia Pacific
Rinnie Nardone	TNC/Philanthropy
Dan Newman	Facilitator, The Value Web
Marie-Claire Paiz	TNC/Latin America
Karen Raven	TNC/New York
Bob Steneck	TNC Trustee/University of Maine
Heather Tallis	TNC/Central Science
Jodie Toft	Natural Capital Project
*Stephanie Wear	TNC/Global Marine
Laura Whitford	TNC/Asia Pacific
Jono Wilson	University of California at Santa Barbara
*Indicates participation in 2 or more working groups	