WCS's Shark and Ray Conservation Program: The 10 by 10 Initiative

(2020-2030)

Wildlife Conservation Society

Fisher engagement in Bangladesh

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Executive Summary

Sharks, rays, and their cartilaginous relatives (class Chondrichthyes, hereafter "sharks") are one of the world's most threatened species groups and are flagship species for the Wildlife Conservation Society's global conservation work.

The primary threat to sharks is from unsustainable fishing pressure, including target and non-target catch. The biological characteristics of many shark species make them inherently vulnerable to overfishing, and this threat is exacerbated by a lack of species-specific management (Dulvy et al., 2017). This management gap is particularly problematic in low-income ocean-dependent countries, which also include many of the world's largest shark-fishing countries (Booth, Squires, & Milner-Gulland, 2019).

The core of WCS's global shark work from 2020 to 2030 will focus on overcoming this management gap. We will demonstrate that comprehensive policy reforms and their implementation at a country-wide level—which are informed by robust research on shark populations and fisheries and implemented through locally-relevant practical approaches—can reduce overfishing of some of the world's most threatened species and eventually lead to population recovery.

Our overall vision is that ***sharks and rays are effectively protected and sustainably managed, delivering ecological and socio-economic benefits to people and ecosystems***. This vision acknowledges that sharks are a diverse species group (over a thousand species), with a variety of values and functions, which require a range of approaches for effective conservation.

We will deliver this vision via the **10 by 10 initiative**: Comprehensive, science-based, well-implemented shark management reforms in 10 key geographies across the globe over the next 10 years (10 x 10, from 2020 to 2030). Successful delivery of this initiative will establish measurable conservation impact by **halting population declines, preventing extinctions, and moving shark populations towards recovery.**

To achieve this, we will take an integrated approach, delivered through a holistic program of work that focuses on management reforms in three priority areas in each country or region:

- **Protecting species**
- **Managing fisheries**
- **Controlling trade**

Each of the above will be delivered through building strong **capacity and institutions**, and informed by robust **ecological and socio-economic research**.

This document provides background on why and where we work on sharks, and identifies how we can build on our work to date to deliver the fundamental global change these species need.

2 Background & Justification

2.1 The threats facing sharks

Sharks are one of the world's oldest and most diverse vertebrate groups with over a thousand species found in a huge range of habitats, from the Amazon River to the ocean's deepest points, and they provide a range of benefits to society. They help to maintain healthy and productive ocean ecosystems via their role as top predators and also play important roles in coastal livelihoods and food security through fisheries and tourism. As with many higher-level predators, sharks often grow slowly, have few young, and range widely—and this has made them vulnerable to rapid population declines globally: sharks are often the first species whose populations crash in unsustainable, unselective fisheries.

In terms of conservation action, the biology of sharks will require measures that resemble those in place for large, slow-growing mammals, rather than rapidly reproducing bony fish. However, to date, sharks have not received the careful conservation and management steps that other top predators, such as tigers or orca, are subject to in much of their range.

Figure 1. The life histories of shark species, compared to those of mammals and bony fish

		LONGEVITY/LIFESPAN (years)	MATURITY (years)	OFFSPRING	REPRODUCTIVE FREQUENCY	GESTATION LENGTH
MAMMALS	ELEPHANT	60	10–12	1	4–9 years	18–22 months
	ORCA	50	14–15	1	4–6 times in life	15–18 months
	BENGAL TIGER	25	3–5	1–7	3–4 years	3–4 months
SHARKS & RAYS	MANTA RAY	50	5–10	1	3–6 years	12–13 months
	DUSKY SHARK	40–50	17–24	3–16	3 years	22–24 months
	SILKY SHARK	22	6–12	2–16	1–2 years	12 months
BONY FISH	TUNA	8	2–3	10 million	multiple events per year	1 day
	SWORDFISH	13	3	4.3 million	multiple events per year	2.5 days
	MAHI MAHI	5	5–12 months	80k–1 million	2-3 per year	2.5 days

The Papua New Guinea seascape—among the last strongholds for critically endangered shark species

Many species in this globally-important taxon are facing extinction, primarily due to high levels of fishing mortality in both targeted and non-targeted fisheries. This is driven by a complex interplay between local- and macro-economic factors, from the billion-dollar trade in shark-derived commodities and the general expansion of global fisheries footprints to the need for livelihood and food security in low-income nations. Dramatic population declines have been documented throughout the world, with an estimated 54% of species now threatened with extinction or in immediate danger of becoming threatened (Dulvy et al., 2014). This makes sharks one of the most threatened species groups in the world.

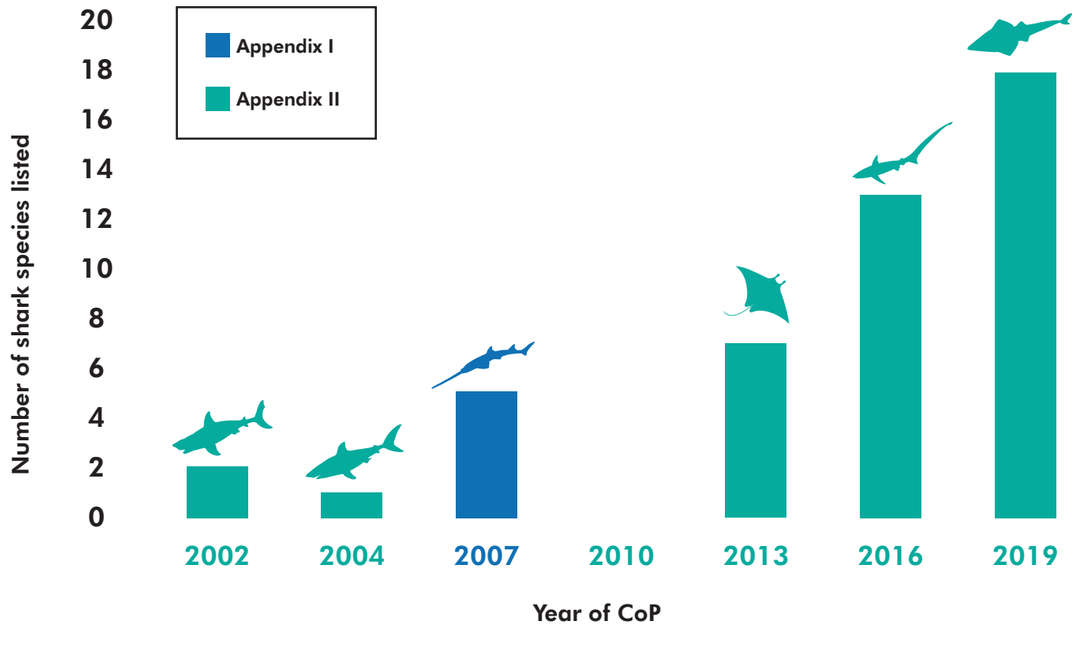
Currently, with rare exceptions, the value of sharks as marine resource is not reflected in their management. Unlike other fish species that command a high market price (such as tuna) or charismatic marine megafauna with similar life histories and ecotourism potential (such as cetaceans), sharks are subject to inadequate management almost everywhere outside of a handful of countries with expensive fisheries management regimes (such as Australia), or a similarly small number of countries that have fully protected sharks for their ecotourism value (such as the Bahamas). Moreover, their often wide-ranging or highly-migratory behavior poses additional challenges for management, with a range of interventions needed throughout their ranges and life histories to ensure that any fisheries mortality is sustainable.

This lack of management has been exacerbated by poor or incomplete data, limited political will and incentives, and quick fixes that don't reduce shark mortality and often neglect the socio-economic complexities of real-world fisheries management. These challenges, coupled with the relative recency of shark conservation as a global issue, mean there are very few successful examples to learn from and apply.

2.2 The Opportunity for Change

However, there is now an opportunity for change. Improved research is feeding in to clearer scientific advice, and the recent inclusion of commercially traded sharks and rays on the Appendices to the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) is creating a high-level driver for data-driven management reform. Thirty-eight species of sharks and rays have been listed on CITES Appendix II since 2013 (bringing the total to 46 species listed on Appendices I and II, Figure 2). These are the first commercially-traded shark species subject to such regulation, which now covers an estimated 25% of the global fin trade (by volume, given the species listed to date), and mandates that international trade in these species must be legal and sustainable.

Figure 2. History of shark listings on the CITES Appendices (Booth et al., 2020)

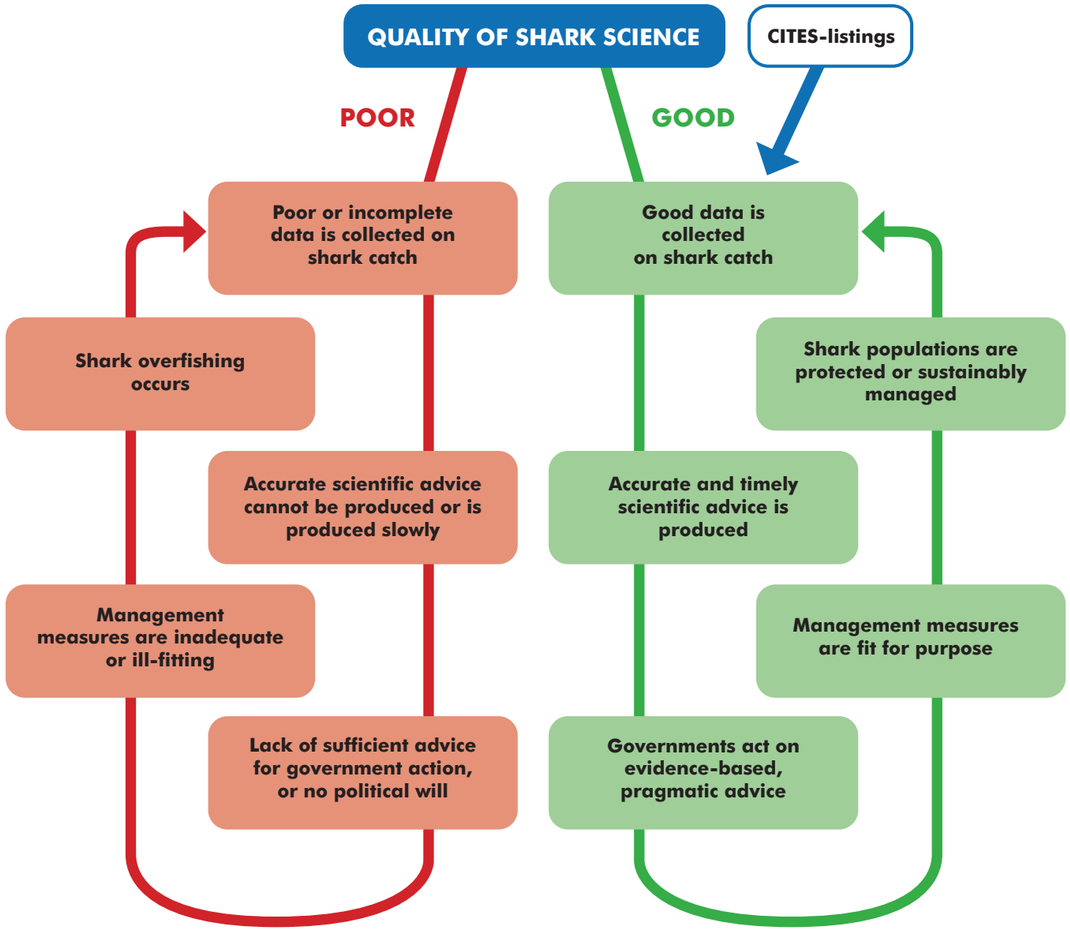


The legally-binding nature of CITES, along with the threat of its strong compliance processes, has begun disrupting the cycle of shark management inaction in many parts of the world (Figure 3), with increased political will for improved shark management. These listings have been reinforced by a groundswell of government, NGO, and private donor (foundation) investment in shark conservation. New regulations have been put in place and there are the first indications of declines in the global shark fin trade. This model, with continued action and proper implementation, can drive continued political change, investment, and conservation action.

Yet, despite this high-level policy progress, much work remains to translate international obligations into measurable changes in shark fishing mortality and population recovery, even as better data becomes available and additional international drivers are established.

Left: Dried shark fins prepared for the lucrative shark fin trade

Figure 3. Breaking the cycle of shark management inaction through better data and global policy change



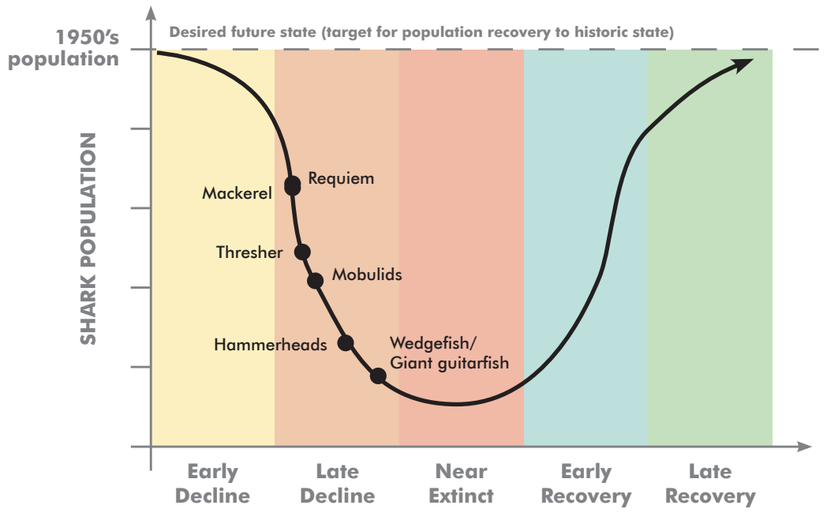
To date, 15 countries worldwide have declared shark sanctuaries, and three developed countries have established sustainable fisheries, underpinned by sophisticated and costly monitoring programs (Simpfendorfer & Dulvy, 2017; Ward-Paige, 2017). However, throughout the rest of the world, including everywhere WCS has marine-focused field programs, progress towards protections or sustainable management is limited, but with notable signs of progress, often driven by the last decade of CITES listings and the focused implementation work coupled to them. Moreover, it is necessary to build beyond CITES, to ensure that non-listed species are also considered and, find synergies with wider international processes for fisheries management, marine conservation, and sustainable development (e.g. CBD, CMS, RFMOs, RSCs, RFBs and SDGs). For these reasons, sharks and rays have been identified as a flagship species group for WCS's marine conservation programs around the globe.

2.3 The WCS 2030 and species strategies

Through the WCS 2030 strategy, our priority will be to develop a global portfolio of nature's strongholds, representing the places with the highest ecosystem integrity. This will build on our long-standing work to establish and strengthen protected areas, while maintaining the rights of Indigenous Peoples and local communities. We will expand our work to include the protection and rewilding of these landscapes and seascapes to enhance their ecosystem integrity and their resilience to climate change. We will also continue to work to protect a set of flagship species in order to make certain that populations are stable or increasing over time in each of our priority regions.

This 10-year sharks and ray strategy will align with, and work in partnership with, the WCS 2030 strategy, with seven families identified in this document establishing a list of flagship species for WCS's marine conservation work over the next decade. The species strategy aims to "bend the curve" on species declines to create net positive outcomes for nature. Sharks and rays are predominantly still at the initial shoulder of the population decline and recovery curve (some are in better shape, and some are more threatened), and we will focus on establishing holistic management regimes that halt declines, which over time will led to population stability and recovery.

Figure 4. WCS conserves a suite of Priority Species, all meriting conservation programs, with the species-specific actions required depending on where they are on the population decline and recovery curve.



Below: A tiger shark in Indonesia—an apex coral reef predator

The WCS shark strategy also links to the stronghold focus of the overall 2030 strategy. The species approach ensures that shark and ray management considers their often highly-mobile nature and wide-ranging threats; while our ongoing work to establish MPA's and other spatial measures in marine strongholds contributes towards protecting species and managing fisheries at national and regional levels.

Together this place-based and wider species-focused approach will ensure effective, holistic shark conservation is delivered via this strategy's key aims: protecting species, managing fisheries, and controlling trade.

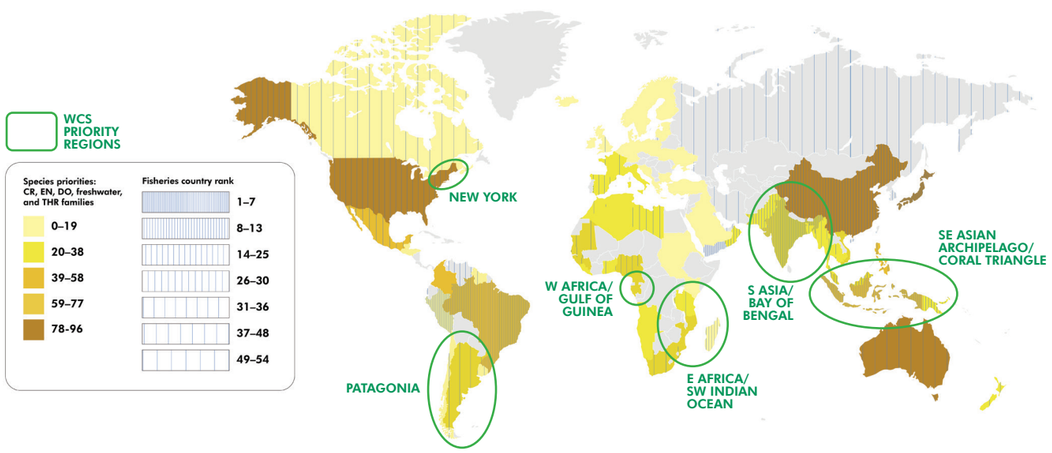
3 Shark & Ray Strategy

3.1 Strategic Priorities

The Global Shark and Ray Initiative (GSRI), a partnership of international NGOs and researchers (of which WCS is a founding partner), identified several priorities for shark conservation globally. That are expanded here to reflect WCS's specific shark and ray strategic priorities:

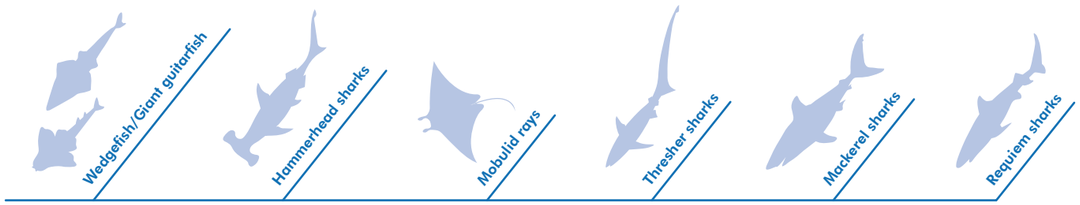
GEOGRAPHIES: **Priority geographies for improved shark management occur where there is a high conservation need yet limited progress to date. These geographies overlap with existing WCS capacities, thus providing an opportunity for WCS to take a leading role in shark conservation over the next decade (Figure 5).** Most existing examples of good management are in wealthy countries in the global north, while actions outside of developed nations have focused predominantly on a limited number of protected species or blanket shark fishing bans, which are not fit-for-purpose for all species and geographies.

Figure 5. Threatened species and fisheries priority geographies (adapted from Dulvy et al., 2017) and WCS's marine programs, and areas of shark conservation focus



SPECIES: **There are seven priority families** on which our work will focus. These are families which have the most pressing conservation needs, based on status in the IUCN Red List of Threatened Species, and are subject to strong fisheries pressure, have significant conservation opportunity (including CITES and other policy drivers), and overlap with WCS's geographies (Figure 6). We will also support conservation of regionally endangered and/or endemic species, or those under particularly severe pressure, such as sawfish, whiptail stingrays, and angel sharks, as relevant in our priority geographies.

Figure 6. Seven priority families



INTERVENTIONS: **Shark management can take various forms, from full protection to sustainable use.** The GSRI articulates four priority interventions types, which inform our approach: saving species, managing fisheries for sustainability, ensuring responsible trade, and encouraging responsible consumption.

A silky shark in Malaysia—one of the most frequently caught shark species in the world

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3.2 The 10 x 10 Approach

The core aim of the WCS 10 x 10 initiative is the delivery of 10 country-level examples of science-based, comprehensive, well-implemented shark management reforms in key geographies for shark conservation globally over the next 10 years (10 x 10).

Delivery on this initiative by WCS programs around the world will halt population declines, prevent extinctions, and move shark populations towards recovery.

The 10 x 10 approach seeks to combine scalability at a global level with species- and context-specificity at national and local levels. Each geography in the 10 x 10 initiative will develop their own regional, national, and local strategies and approaches to progress shark conservation, as suited to their species and local/national situation. Simultaneously, our big picture theory of change and global priority reforms will facilitate scaling of impact across sites, seascapes, and shared-stocks, delivering transformational change at a global level.

This approach is summarized herein through:

GLOBAL

LOCAL

1. WCS big picture theory of change (Figure 7)
2. WCS priority management reforms, key considerations in developing them at the fisheries and species level, and their pathway to impact (Figure 9)

Working with small-scale fishers to reduce bycatch

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3.2.1. The big picture theory of change: combining top-down and bottom-up actions

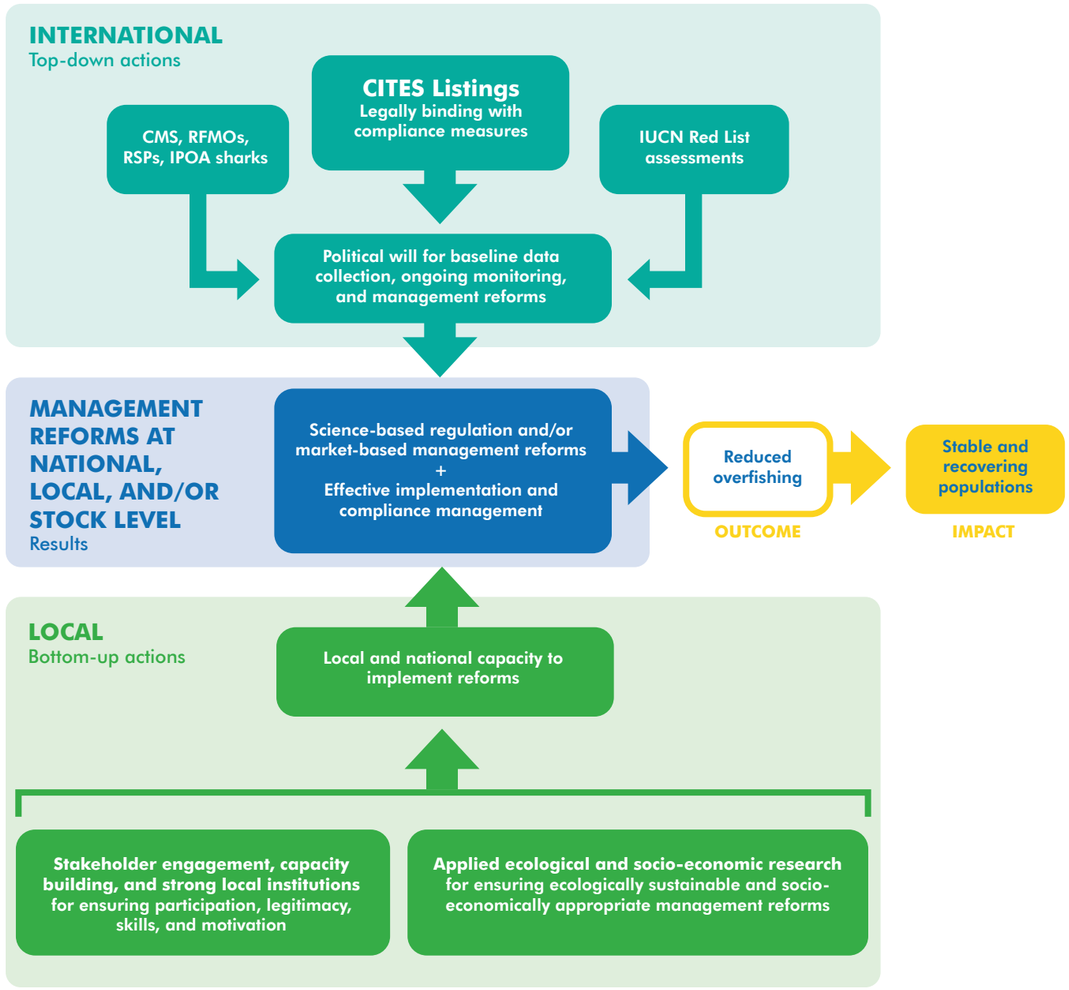
To deliver the 10 x 10 initiative, WCS will take the priorities identified in the GSRI strategy and establish an integrated approach to achieve them, combining top-down and bottom-up actions.

1. **Top-down actions** will continue to build high-level political momentum for effective, science-based shark management, with CITES and its compliance mechanisms as a key driver for data collection, management and enforcement reforms, coupled with additional drivers via CMS, RFMOs/RFBs/RSPs, and updated IUCN assessments.

2. **Bottom-up actions** will capitalize on this momentum and the need for practical change, and provide global leadership in design and implementation of management reforms, to deliver measurable conservation outcomes, on the ground and at scale.

Together these actions will reduce overfishing, and lead to conservation impact (Figure 7).

Figure 7. A theory of change for the 10 x 10 initiative: an integrated top-down/bottom-up approach to reduce shark overfishing



Top-down actions: building political momentum

The 38 species of shark and ray listed on the CITES Appendices since 2013 (Figure 2) fall into seven priority families: requiem sharks, mackerel sharks, hammerhead sharks, thresher sharks, wedgefish, giant guitarfish and mobulid rays (Figure 6). Given the scale and scope of the international trade, and the fact that these seven families likely make up over 80% of the shark fin trade and all the gill plate trade (Fields et al., 2018), there is strong justification for listing all remaining significantly-traded species in these families on CITES Appendix II within the next decade, with priority given to those with adverse conservation status or geographically-limited ranges.

Acknowledging these advantages and opportunities, we will:

1. Work with interested national governments to support proposals to list additional species at future CITES CoPs
2. Develop and deliver global tools and guidance to support implementation and enforcement of CITES for all current and potentially future-listed shark and ray species
3. Look to develop partnership with governments and intergovernmental institutions to progress shark conservation action as it becomes an institutional priority, developing linkages to existing marine conservation initiatives (such as wider fisheries work, cetacean conservation, or MPA establishment and management)

Importantly, we emphasize that listing of all significantly traded species will not solve all issues facing sharks: effective CITES implementation must include fisheries management interventions to reduce mortality. Rather, CITES listings and the compliance action that will follow create an opportunity to drive more rapid domestic management reforms. Our work in other fora, such as CMS and RSPs, will add to this political momentum; and, combined with our bottom-up actions, will enable these policy levers to create conservation impact. This potential for facilitating change is reflected in Figure 7 and Figure 9.

Bottom-up actions: designing and implementing management reforms

We will compliment this top-down political momentum with bottom-up actions to progress the initiatives aims. Priority management reforms for the 10 x 10 strategy fall under three broad types of interventions (Figure 9), which correspond to three of the four GSRI priority interventions*:

1. **Protecting species**
2. **Managing fisheries**
3. **Controlling trade**

Priority actions for each intervention will be established in each 10 x 10 site to ensure holistic shark management reforms are established: these priority interventions will need to be implemented together, in order to reduce declines and recover populations. Each type of intervention can include a range of different management measures, which will need to be adapted to each species and situation (Figure 8, Figure 9) and effectively implemented.

As such, each management measure will also be:
1. Underpinned by supporting capacity and institution growth that ensures implementation and compliance management (including enforcement)
2. Informed by applied ecological and socio-economic research to identify the most appropriate measures and to monitor impact

While responsible consumption is listed as a GSRI priority intervention, it is not listed here as it is not a priority for WCS's shark geographies.

3.2.2. Priority management reforms

AVOIDING catch and trade of certain shark species all together, as far as possible. This is particularly appropriate for species which are IUCN endangered/critically endangered and/or CITES/CMS Appendix I, but may also be appropriate for other species in different national contexts.

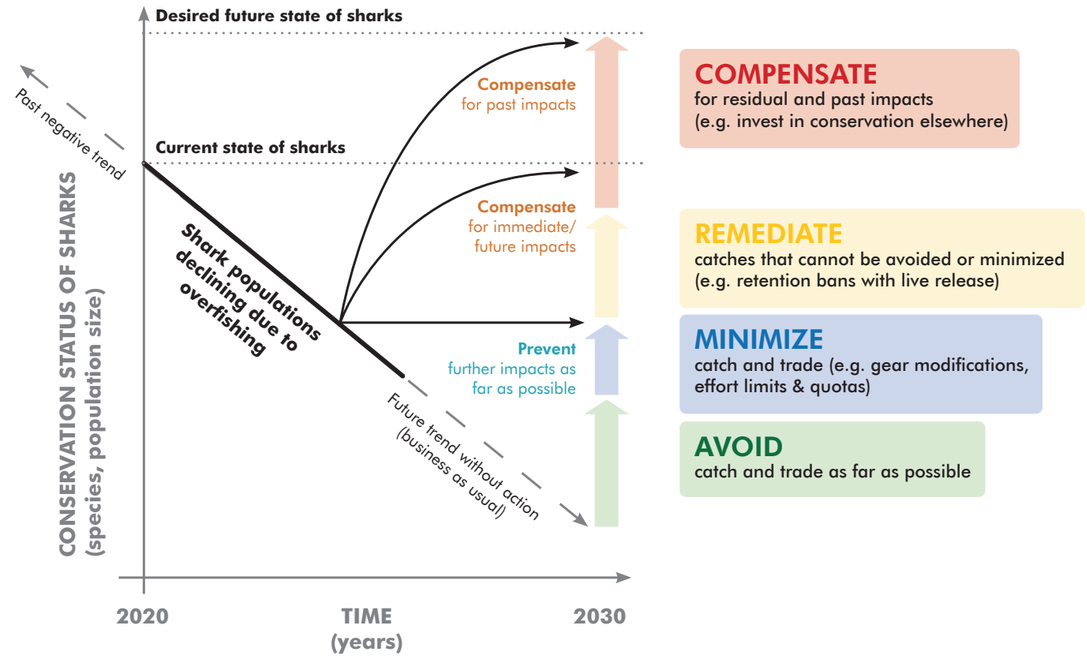
MINIMIZING the number of sharks that are caught and traded, and ensuring traceability and sustainability of that catch and trade where avoidance is not feasible. This is appropriate for CITES Appendix II species and/or species that are IUCN vulnerable/near threatened.

REMEDIATING impacts on sharks where avoidance and minimization is not possible by incentivizing live release in bycatch fisheries. This is appropriate for species with higher survivability, which can be successfully released after capture in fisheries.

COMPENSATING for past and residual future damage to shark populations by investing in conservation actions that enable population recovery. This is appropriate for all species, and includes actions to boost species survival, such as improving nursery ground and pupping habitat.

When combined, these measures will prevent further impacts of overfishing as far as possible, thus halting declines, as well as compensate for past impacts, thus enabling long-term population recovery.

Figure 8. Priority actions for bending the curve on shark population declines



Human well-being, equity, and respecting the rights of Indigenous Peoples and local communities

Conservation does not have a great track record when it comes to human rights; however, people-centred approaches to shark conservation are essential for achieving our vision in which sharks provide benefits to ecosystems and people. As such, we are committed to maintaining or improving the well-being of project-affected people, particularly Indigenous Peoples and small-scale fishers. We will build on common interests between shark conservation and local communities where these occur, and also engage in honest and open negotiation about conflicts of interest and work towards shared solutions, with full respect for the rights of Indigenous Peoples and local communities and their free, prior, and informed consent (Newing and Perram, 2019).

This means different approaches are needed for managing small-scale subsistence fisheries than industrial-scale commercial fisheries. For example, stronger regulations with enforcement sanctions may be appropriate in industrial fisheries, whereas rights-based approaches will be needed in small-scale fisheries (Figure 9), such as Marine Conservation Agreements and payments for ecosystem service schemes (e.g. Shark Reef Marine Reserve in Fiji, WCS 2020)

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3.2.3. Key considerations for designing shark management reforms

It is important to note that with more than 100 species within our priority families, many different fisheries, and a range of local uses and government positions, the appropriate mix of measures needed to safeguard shark populations will need to be adapted to different species and situations. In particular, the following issues should be considered:

1. **Biophysical** (based on species life histories and ecology)
2. **Fisheries** (based on operational characteristics of fisheries)
3. **Socio-economic** (including both local and international context)

These factors both inform and constrain the types of interventions and specific management reforms which will be effective and feasible for different species and situations.

Figure 9 summarizes the focal management reforms within the 10 x 10 initiative, and how they might be applied to different species and contexts.

In designing these measures, each 10 x 10 project will differ, based on the composition of species caught in fisheries, the type of management that is politically viable, and the ability to engage with key stakeholder groups and priority geographies.

3.2.4. Linkages to existing WCS programs of work and areas of expertise

All of the work identified in the 10 x 10 initiative has close ties with and benefits from WCS's ongoing programs of work on marine conservation, enforcement of protected areas, and efforts to combat illegal wildlife trade. These existing efforts will aid the delivery of the 10 x 10 strategy, and the establishment and implementation of the measures identified in Annex 1. Notable programs of work that will aid the implementation of this strategy include:

- **SMART monitoring and enforcement patrols**: using the Spatial Monitoring and Reporting Tool to ensure that protected areas set as part of the 10 x 10 strategy are effectively enforced: smartconservationtools.org
- **MPA Fund**: WCS's work to establish and maintain marine protected areas around the world via the MPA fund, and our ongoing commitment to safeguard marine wilderness, which includes significant shark habitat: mpafund.wcs.org
- **IWT**: WCS's ongoing commitment to reduce the impacts of the Illegal Wildlife Trade (IWT) that will increasingly include sharks, and support of initiatives to bring marine wildlife crime into these discussions, through support of innovations such as the Wildlife Crime Unit (WCU) in Indonesia: wildlifecrimesunit.org

All of this work, and the wider 10 x 10 initiative, is built upon WCS's commitment to building strong, lasting relationships with local and national government agencies, local communities and civil society organizations, and industry groups. This collaborative, capacity-building approach will underpin all of the shark conservation work delivered under this strategy.

Figure 9. Priority management reforms, underpinning actions, and the pathway to determine when to utilize each type of intervention. Details of how these are being implemented in each 10 x 10 project site is included Annex 1.

UNDERPINNING ACTIONS

LOCAL (bottom-up) actions

APPLIED RESEARCH

Interventions informed by a strong socio-ecological evidence base
E.g. landings data, market surveys, stock assessments, household surveys, participatory planning

CAPACITY AND INSTITUTIONS

Interventions underpinned by stakeholder engagement and capacity, and robust legal and economic instruments
E.g. Law enforcement and species ID training, community-based monitoring, livelihood interventions, performance-based incentives

INTERNATIONAL (top-down) actions

CITES LISTINGS

Legally binding with compliance measures

IUCN RED LIST ASSESSMENTS

Globally-accepted information on threat status, to urge conservation action

OTHER CONVENTIONS AND POLICY LEVERS

E.g. CMS, RFMOs, RSPs, IPOA-Sharks

LOCAL & NATIONAL CAPACITY

POLITICAL WILL

MANAGEMENT REFORMS

PROTECTING SPECIES

Species-specific measures to protect, prevent capture, and halt trade of the most threatened shark families
E.g. Protected species lists, retention bans with live release protocols, trade bans, critical habitat protection

MANAGING FISHERIES

Practical approaches for mitigating overfishing of threatened shark families, while allowing for sustainable exploitation of more abundant species and commercially important fish.

Including:

AVOID	MINIMIZE	REMEDIATE	COMPENSATE
E.g. MPAs and fishery closures	E.g. bycatch reduction tech, sustainable catch quotas	E.g. retention bans and post-capture live release protocols	E.g. bycatch levies and biodiversity offsets

CONTROLLING TRADE

Ensuring full implementation of CITES through domestic measures in seas and at borders
E.g. NDFs, trade quotas, customs and judiciary measures, traceability and labeling

PRIORITY FAMILIES & THEIR CHARACTERISTICS

Wedgefish & giant guitarfish	Hammerhead sharks	Mobulid rays	Thresher sharks	Epipelagic requiem & mackerel sharks	Inshore requiem sharks
Biophysical: Large, slow life history, fairly robust to capture	**Biophysical:** Aggregating, slow life history, low survivability	**Biophysical:** Large, moderate-to-slow life history, moderately robust to capture	**Biophysical:** Low fecundity, moderate-low survivability	**Biophysical:** Relatively fecund, moderate survivability	**Biophysical:** Moderate life history and survivability
Fisheries: All demersal & coastal (e.g. bottom net and line, trawl)	**Fisheries:** Vulnerable to all high-seas and coastal fisheries (net, line, trawl)	**Fisheries:** Pelagic and coastal (e.g. seine, net, line)	**Fisheries:** Pelagic high-seas and coastal fisheries (mostly line)	**Fisheries:** High-seas industrial fisheries with poor management/enforcement (e.g. seine and line)	**Fisheries:** Multi-species coastal tropical fisheries (net, line, trawl)
Socio-economic: Extremely valuable in international trade	**Socio-economic:** Valuable in international trade	**Socio-economic:** High international trade value, high tourism value	**Socio-economic:** Moderately valuable in international trade	**Socio-economic:** Moderately valuable in international trade	**Socio-economic:** Limited value in international trade, can be important for local food security

- Critically Endangered
- Endangered
- Vulnerable

EXAMPLE MANAGEMENT APPROACHES FOR DIFFERENT SPECIES & SITUATIONS

The arrows and associated fisheries management methods shown in this figure are examples, that will differ in their effectiveness in any given location or fishery. Any combination of these interventions will be potentially effective for any species in the priority families, or wider sharks and rays that are impacted by fisheries pressure.

E.g. Small-scale coastal tropical gillnet fishery taking wedgefish as valuable secondary catch. Wedgefish co-occur with target species, and are highly valuable in international trade. Fishers have limited resources and adaptive capacity.

- **A** Managed gill net use in areas with highest secondary/non-target catch ratios.
- **M** Restrictions or low quota. Free gear swaps.
- **R** Live release protocols, handling training, and performance-based incentives. Trade interventions to reduce incentives to retain.

E.g. Commercial longline tuna fishery taking pelagic sharks as secondary/non-target catch in western and central Pacific Oceans, with direct overlap between shark stocks and target species. Pelagic sharks are marketable catch. Closure of large areas of fishing ground not economically viable.

- **A** Spatio-temporal closures where feasible.
- **M** Species-specific fishing restrictions or low quota, with FAD regulations.
- **R** Best practice live release protocols. Trade interventions to reduce incentives to retain.
- **C** Mandatory on-vessel monitoring. By-catch tax for mortality over and above quota to incentivize good performance and compensate for unavoidable mortality.

Examples of work in action: Indonesia & Southwest Indian Ocean

The 10 x 10 strategy is founded on WCS's past successes and continuing initiatives in Indonesia and the southwest Indian Ocean (Kenya, Tanzania, Mozambique, and Madagascar). In these geographies we already have comprehensive shark programs which will implement the 10 x 10 initiative.

To date, these programs have focused on initial steps: gathering baseline data, introducing basic policy measures, building adaptive capacity of fisher communities, and assisting with enforcement action. They will continue to grow during the 10-year strategy, and the progress they have made to date will inform the other country and regional programs within the 10 x 10 initiative.

INDONESIA

Indonesia is a global priority for improving the status of sharks and rays, as it is a hotspot of species diversity, and also the world's largest shark-fishing nation.

Vision

"Sharks and rays are effectively protected and sustainably managed in Indonesia, delivering ecological and socio-economic benefits to people and ecosystems."

Strategic Priorities

For priority species, WCS focuses on highly threatened, endemic, and/or CITES-listed species, allowing us to protect the most at-risk species, while leveraging international policy and political will.

For focal sites, WCS and partners work in several provinces, which simultaneously reflect conservation priorities for shark fisheries, habitat, species and conservation opportunities, capacity, leverage, and relationships with stakeholders.

Within these provinces, there are a range of fishery types, which provide a set of case study examples for different approaches to shark management in different socio-ecological contexts. Through national-level policy and wildlife crimes work, WCS leverages CITES as a driver of national-level trade and fisheries reforms.

Goals

Overall, WCS's goals in Indonesia are to:

1. Enhance legal protection of sharks, and overarching policy frameworks to regulate fisheries and trade, through national-level policy reforms based on the best available science.

2. Tackle illegal and unsustainable trade in shark products through building capacity of key stakeholders to implement and enforce management reforms in seas and at borders.

3. Tackle unsustainable fishing through enabling effective implementation of management reforms at the local/fishery level.

We anticipate this will lead to measurable declines in fishing mortality of priority species, while also offsetting the negative socio-economic impacts of shark conservation on small-scale fishing communities. This will represent some of the first examples of effective and well-evaluated shark management outside of advanced-economy countries, from which lessons can be learned and applied to other similar fisheries in the country, region, and worldwide.

Notable achievements to date

To date, WCS and others working on this issue in Indonesia have:

- **Facilitated policy development for CITES implementation, with five key national-level policies on trade management of CITES-listed species introduced since 2014.**

- **Used the best-available socio-ecological data to develop fishery management plans, with 130,000 ha of critical habitat under spatial management, 130 fishers engaged in cooperatives, and Indonesia's first shark management plan developed and legalized in West Nusa Tenggara Province.**

Critically endangered hammerhead sharks, caught in small-scale fisheries

"...the appropriate mix of measures needed to safeguard shark populations will need to be adapted to different species and situations."

—Luke Warwick // Director, WCS Sharks and Rays Program

SOUTHWEST INDIAN OCEAN

The southwest Indian Ocean (SWIO) is a global hotspot for shark and ray diversity, with high levels of endemic species. However, owing to overexploitation, 30% of all chondrichthyan species found in the SWIO region are classified as threatened by the IUCN.

Vision

"Improved conservation status of shark and ray species and sustainable utilization and management of chondrichthyan resources in the southwest Indian Ocean, through key conservation actions for target species."

Strategic Priorities

For priority species, WCS's SWIO program focuses on threatened shark and ray species (those listed as vulnerable, endangered, and critically endangered on the IUCN Red List) and particularly threatened endemic species, species listed on appendices of regional or international conventions, and species that are caught in large numbers, as well as data deficient species.

For focal sites, WCS SWIO conducts science-based conservation in four core countries in the SWIO region: Madagascar, Mozambique, Kenya, and Tanzania. Field activities focus on inshore coastal habitats (coral reefs, shallow soft-sediment habitats, mangroves, and lagoons), within which artisanal, small-scale, and traditional fisheries primarily operate. These habitats are critical to the ecology and life history of certain shark and ray species, providing feeding and pupping grounds and sheltered nurseries and they are sensitive habitats that can be negatively impacted by human disturbances.

Goals

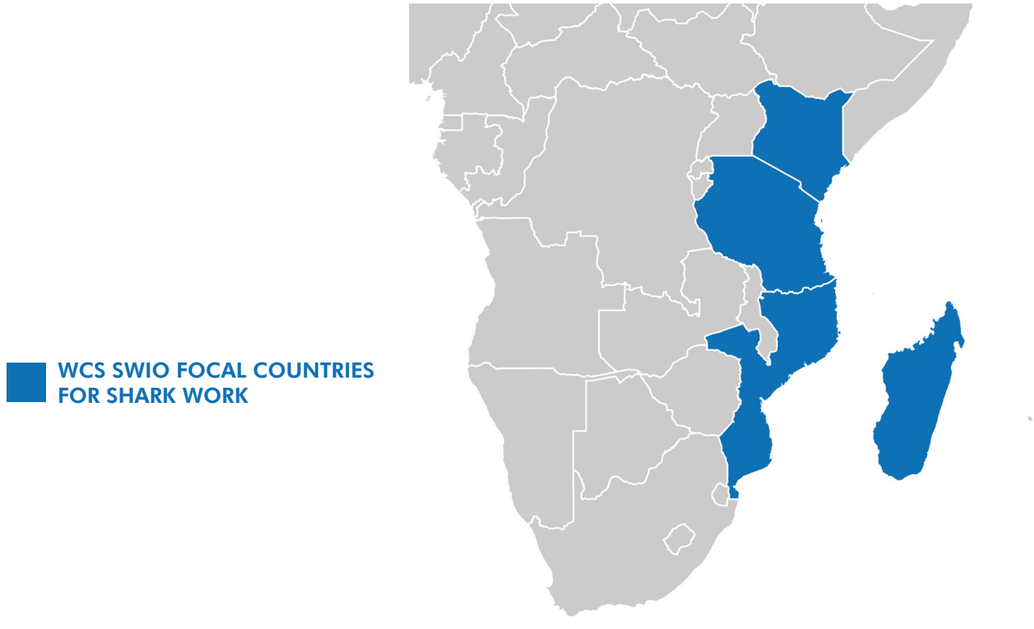
Overall, the goals of WCS SWIO are to:

1. Improve knowledge on chondrichthyan species in the SWIO.
2. Engage with fishing communities and facilitate community-led management to promote sustainable utilization of marine resources.
3. Create awareness of the conservation status of sharks and rays and the need to conserve these species, through education, social media, and dissemination of scientific data.
4. Support policy and legislation development through engagement with national governments and regional and global conservation bodies.
5. Build regional capacity for shark and ray conservation within WCS and partner organizations in the SWIO.

The combined top-down, bottom-up approach, based on scientific data, will ensure a balance between protecting the most threatened species and sustainable harvesting of species more resilient to fishing pressure. We anticipate that this will reduce declines in fishing mortality of priority species and improve the population and conservation status for threatened sharks and rays.

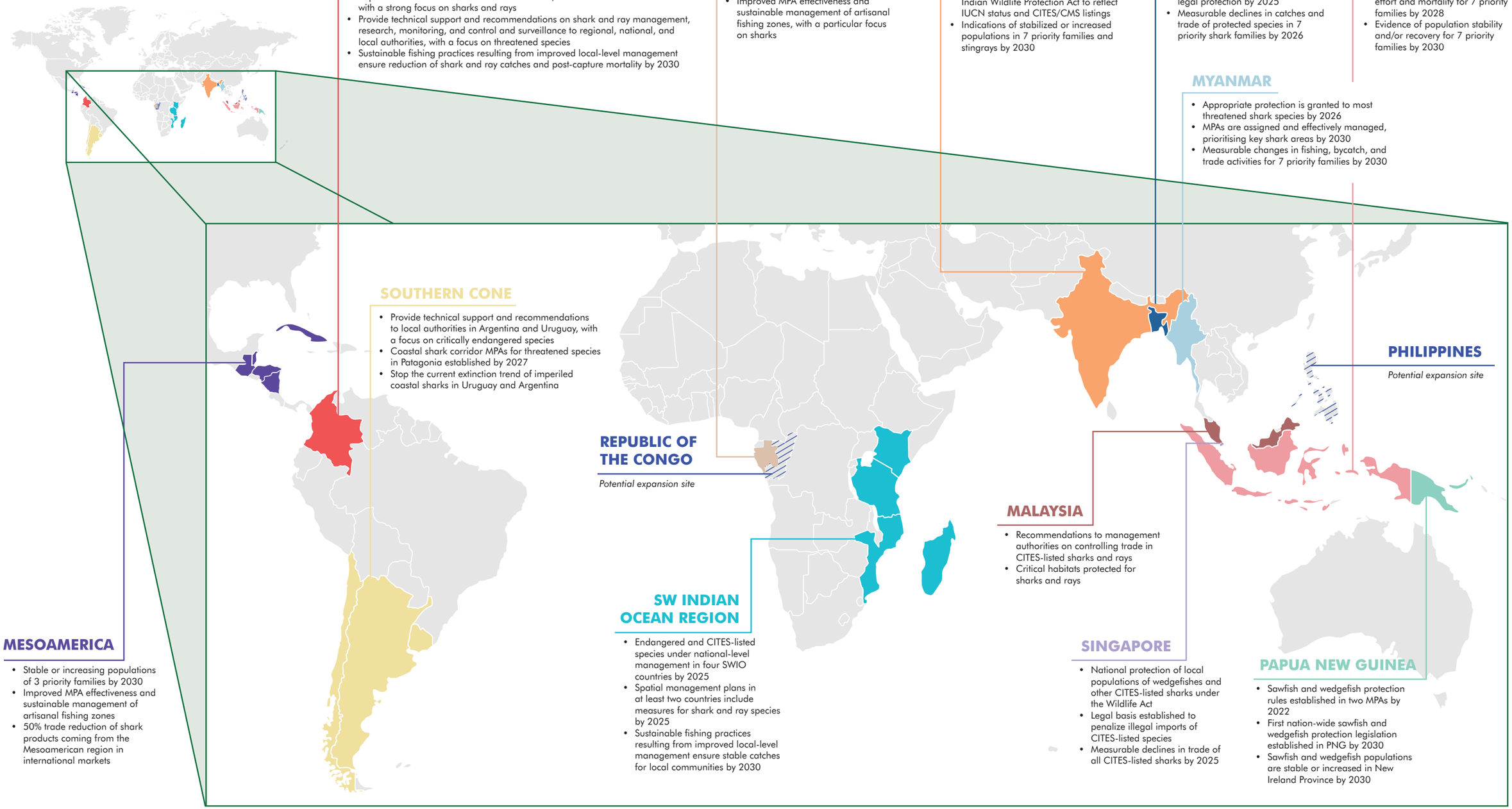
Notable achievements to date

- **Multi-year shark and ray catch data shared with governments of Mozambique, Kenya, and Madagascar to inform species-level management measures**
- **Supported policy development through supporting the governments of Madagascar, Kenya, Mozambique, and Tanzania to develop National Plans of Action for shark and ray conservation**
- **Supported revision of fishery regulations in Mozambique, including full protection for 14 threatened shark and ray species**



Annex 1—10x10 Sites

Details of actions to deliver identified priorities in Figure 9 (priority management reforms, underpinning actions and tips and tools for each type of intervention) for each 10 x 10 project:



COLOMBIA

- Improve coastal and oceanic MPA effectiveness, with a strong focus on sharks and rays
- Provide technical support and recommendations on shark and ray management, research, monitoring, and control and surveillance to regional, national, and local authorities, with a focus on threatened species
- Sustainable fishing practices resulting from improved local-level management ensure reduction of shark and ray catches and post-capture mortality by 2030

SOUTHERN CONE

- Provide technical support and recommendations to local authorities in Argentina and Uruguay, with a focus on critically endangered species
- Coastal shark corridor MPAs for threatened species in Patagonia established by 2027
- Stop the current extinction trend of imperiled coastal sharks in Uruguay and Argentina

MESOAMERICA

- Stable or increasing populations of 3 priority families by 2030
- Improved MPA effectiveness and sustainable management of artisanal fishing zones
- 50% trade reduction of shark products coming from the Mesoamerican region in international markets

GABON

- By-catch of the 7 priority families is reduced at least by 50% by 2025
- Species-and-habitat-level protections established for the 7 priority families
- Improved MPA effectiveness and sustainable management of artisanal fishing zones, with a particular focus on sharks

REPUBLIC OF THE CONGO

Potential expansion site

SW INDIAN OCEAN REGION

- Endangered and CITES-listed species under national-level management in four SWIO countries by 2025
- Spatial management plans in at least two countries include measures for shark and ray species by 2025
- Sustainable fishing practices resulting from improved local-level management ensure stable catches for local communities by 2030

INDIA

- Improved evidence base on population and utilisation status of all 7 priority families and stingrays
- Revised listings of shark species in the Indian Wildlife Protection Act to reflect IUCN status and CITES/CMS listings
- Indications of stabilized or increased populations in 7 priority families and stingrays by 2030

BANGLADESH

- Sharks incorporated into management measures of two MPAs by 2025
- All CITES and CMS protected and IUCN CR/EN sharks brought under legal protection by 2025
- Measurable declines in catches and trade of protected species in 7 priority shark families by 2026

INDONESIA

- All CITES-listed species under national-level management by 2025
- Measurable declines in fishing effort and mortality for 7 priority families by 2028
- Evidence of population stability and/or recovery for 7 priority families by 2030

MYANMAR

- Appropriate protection is granted to most threatened shark species by 2026
- MPAs are assigned and effectively managed, prioritising key shark areas by 2030
- Measurable changes in fishing, bycatch, and trade activities for 7 priority families by 2030

PHILIPPINES

Potential expansion site

MALAYSIA

- Recommendations to management authorities on controlling trade in CITES-listed sharks and rays
- Critical habitats protected for sharks and rays

SINGAPORE

- National protection of local populations of wedgefishes and other CITES-listed sharks under the Wildlife Act
- Legal basis established to penalize illegal imports of CITES-listed species
- Measurable declines in trade of all CITES-listed sharks by 2025

PAPUA NEW GUINEA

- Sawfish and wedgefish protection rules established in two MPAs by 2022
- First nation-wide sawfish and wedgefish protection legislation established in PNG by 2030
- Sawfish and wedgefish populations are stable or increased in New Ireland Province by 2030

Measuring Impact and Tracking Progress

Across our global scope of work we will utilize a range of key performance indicators, which will measure progress towards the actions, intermediate results, outcome, and impact in our theory of change (Figure 7):

Along with the 10 projects identified here, WCS will look for opportunities to expand our shark and ray work to additional geographies during the decade of the 10 x 10 initiative. This includes locations where WCS has established or is developing programs of marine work, such as the Congo and the Philippines.

ACTIONS	RESULTS	OUTCOMES	IMPACT
KPIs:	**KPIs:**	**KPIs:**	**KPIs:**
Improved global evidence-base for **7 priority families**; Proactive engagement with **>25 fisher communities/ companies.** Improved capacity for **10 national governments.** At least 50% of global fin trade covered under international policy by **2025.**	New regulatory and/or market-based reforms for 7 families in **10** countries and **20 fisheries by 2025.** Measurable changes in fishing and trade activities for **7 families in 10** countries by **2027.**	Measurable declines in fishing effort and mortality for 7 families in 10 countries by 2028, vs. 2019 baseline. Fishing of 10 stocks within scientifically-robust sustainable catch limits by 2028. >25 project-affected coastal communities receive tangible benefits associated with shark conservation by 2030.	Populations of 7 priority shark families in 10 countries are stable and/or recovering by 2030 (vs. 2019 baseline), as per fisheries indicators and BRUV surveys. At least 3 species have improved IUCN Green Status category by 2030. Project-affected coastal communities report maintained or improved well-being.

	ACTIONS	RESULTS	OUTCOMES	IMPACT
BANGLADESH	Promote legal and policy changes to strengthen protection of sharks and rays. Empower law enforcement through training/mentoring. Establish new MPAs and effective management in existing MPAs with a strong shark and ray focus. Monitor shark and ray catches via citizen science networks and inter-agency patrols. Enhance knowledge about threatened sharks and rays and actions to protect them through targeted educational outreach.	All CITES, CMS-protected, and endangered species brought under legal protection and national-level management by 2025. Sustainable fisheries established for at least two CITES Appendix II species by 2025 and four CITES Appendix II species by 2030 through the CITES NDF process. Sharks and rays incorporated into spatial management in at least two MPAs by 2025 and across all coastal waters by 2030. Sharks and rays, including their body parts, reported separately from other fish products in government statistics.	Measurable declines in catches and trade of legally protected species in 7 priority shark and ray families by 2026 compared to 2020 baseline. Shark and ray constituencies in local communities empowered to support law enforcement to combat and monitor illegal shark and ray trade. Marine conservation synergies improve protection of associated marine wildlife (e.g. cetaceans, turtles).	Stable or increasing populations for 7 priority families by 2030, vs. 2020 baseline. Coastal communities gain economic benefits from well-managed fisheries or are at least are no worse off as a result of shark and ray protection by 2030, vs. 2020 baselines.
COLOMBIA	Conduct ecological and socio-economic monitoring on sharks and fishing communities. Proactively engage with small-scale fishing communities in 2 MPAs and 1 large-scale fishery in 1 oceanic MPA. Support government institutions to conduct monitoring and enforcement in coastal and oceanic MPAs. Conduct targeted outreach and training activities with relevant stakeholders.	Time series of non-target fishing and ecological data for shark species in MPAs from 2022 to 2030. Community-based shark conservation initiatives implemented in at least three MPAs by 2025. Fisheries management (e.g. gear modification, live release) for sharks implemented in at least 5 coastal communities and 1 large-scale fishing company by 2027. Alternative, incentive, and/or compensation mechanisms established for at least 5 artisanal fisher communities by 2025. Improved awareness and support for protecting and managing sharks and rays amongst key stakeholders by 2030.	Diver and local communities of 3 MPAs actively participate in shark protection through research, monitoring, and/ or adoption of sustainable practices by 2025. Sustainable fishing practices lead to reduction of shark catches and post-capture mortality by 2030. The Environmental Plan for the Protection and Conservation of Sharks, Marine Rays and Chimeras adopted by the government, with management and research recommendations for species of the 5 priority families and Dasyatidae family (stingrays).	Indications of stabilized or increased shark populations in 3 MPAs by 2030, based on fishing and/or ecological indicators, in comparison to 2023 baseline. Project-affected coastal communities benefit (or at least are not worse off) from well-managed fisheries and/or eco-tourism activities as a result of shark protection by 2030, vs. 2022 baseline.
GABON	Meet with key stakeholders in 25 sites for MPA and fisheries management planning. Establish and strengthen fishing cooperatives and provide skills-building sessions. Train independent observers and government representatives on shark identification. Collect and synthesize data on shark catch and trade.	NPOA submitted to government by 2025, with recommendations including 10 species- and habitat-level protections for 7 priority families. 20 MPA management plans revised to include shark-specific measures by 2024. 5 management plans for artisanal fisheries zones developed by 2023. 41 cooperatives with 1 national confederation established for artisanal fishing sector by 2022, and 70% of cooperative members have necessary business and marketing. 30 observers/government officers per year gain improved shark ID skills, 2020-30.	By-catch of sharks reduced by 50% by 2025. Artisanal fisheries zones and cooperatives improve fisheries sustainability and domestic food security and alleviate poverty by 2025.	Stable or increasing populations for 7 priority families by 2030, vs. 2020 baseline. Improved food security for Gabon's coastal communities by 2030, vs. 2020 baseline.
INDIA	Improve evidence base on population and utilization status of 7 priority families. Proactively engage with 12 fisher communities across 6 coastal states. Proactively engage with government to improve national-level protections for threatened species and implement CITES. Proactively engage with 4 authority groups across 6 coastal states of India to regulate intentional capture or trade of protected species.	Decreased number of DD species by 2025. Revisions to the Indian Wildlife Protection Act for 6 species, plus regional regulations by 2027. CITES scientific/management authorities introduce NDF stipulations for 5 CITES-listed species by 2025 Sharks incorporated into spatial management in at least 2 MPAs by 2025. Fisheries management (gear modification, live release) for sharks implemented in >6 coastal communities by 2027. Improved livelihood options for SSFs in 4 coastal states by 2025.	Measurable declines in domestic consumption of sharks in two coastal states of India by 2025, and four by 2030. Measurable declines in fishing effort and mortality for 7 priority families against 2021 baseline by 2030. Measurable declines in catches and trade of CITES and CMS Appendix I and IUCN Red List critically endangered and endangered species by 2030.	Indications of stabilized or increased populations in 7 priority families by 2030, based on fisheries indicators and/or BRUV surveys, in comparison to 2021 baseline. Improved livelihoods through provision of alternate livelihood options, to at least 6 coastal fishing communities, in comparison to 2021 baseline, by 2030.

	ACTIONS	RESULTS	OUTCOMES	IMPACT
INDONESIA	Collect, synthesize, and share time series data on population status, catch, and trade of 7 priority families across >5 provinces, 2020-30. Proactively engage with 10 small-scale fisher communities and at least one major commercial fishing company, 2020-30. Proactively engage with CITES MA at national-level and 5 provincial governments, to develop and implement regulatory measures, 2020-30.	All CITES-listed species under some form of national-level management by 2025. Shark-specific fishery and spatial management plans in 5 provinces by 2025. Alternative, incentive, and/or compensation mechanisms established for all project-affected communities by 2025. 'No net loss' approach to bycatch mitigation adopted by >1 commercial fishing company by 2025. Government agencies willing and able to enforce regulations, with regular spot checks and legal action (>2 cases per year) 2020-30.	Coastal communities actively participate in shark conservation and adopt more sustainable fishing practices by 2028. Trade, fishing effort, and mortality for 7 priority families declines by 2028, vs. 2019.	Population stability and/or recovery for 7 priority families by 2030 vs. 2019 baseline. Maintained or improved well-being for at least 10 project-affected fisher communities through 2020-30.
MALAYSIA	Conduct outreach, education, and training activities among all relevant stakeholders on the importance of shark and ray conservation as well as relevant laws and skills (e.g., species ID, live release). Conduct long-term research on sharks and rays, especially consumption and trade of CITES-listed species in Sarawak, to support management and enforcement. Facilitate management planning and policy processes for species, fishery, and trade reforms (e.g., increasing visibility of sharks and rays in current laws and providing recommendations to management authorities).	MPAs with shark-specific management measures established by 2050. CR and endemic species under some form of management in Sarawak by 2030. Enforcement officers, fishers, and urban consumers have increased support for shark conservation by 2030 vs. 2021. Report(s) published annually on the state of shark fishing and trade in Sarawak and used to inform CITES implementation, 2020-30. Regular landing, trade, and border monitoring taking place by government agencies 2020-30, with SMART and community-led monitoring incorporated into enforcement efforts. Increase in enforcement action for CITES implementation by 2023 vs. 2019.	Declines in trade, fishing effort, and mortality for CR, endemic, and CITES-listed species by 2028, in comparison to 2019 baseline.	Population stability and/or recovery for CR, endemic, and CITES-listed species by 2030 vs. 2019 baseline.
MESOAMERICA	Engage with with national governments to support policy reform. Engage with fishing communities for facilitation of community-led management. Improve evidence base on population and utilization status of all priority families.	Shark-specific fishers and spatial management plans in at least one site in each of our country programs. MPAs in the Pacific with specific emphasis on sharks. MSP conducted in at least 3 countries in our region with critical areas for sharks. Key Biodiversity Areas for sharks identified in the Caribbean. Supporting MAs on enforcement of CITES-listed shark species at the point of trade to enforce domestic CITES shark protections and trade restrictions. Develop management plans for artisanal fishing zones that factor in the inherent vulnerability of sharks.	Measurable declines in fishing effort and mortality for families represented in the Caribbean (3 families) by 2030. At least 3 target SSF are economically sustainable with low shark bycatch. 50% trade reduction of shark products coming from the Mesoamerican region in international markets.	Stable or increasing populations of 3 priority families by 2030. Improved MPA effectiveness and sustainable management of artisanal fishing zones.

	ACTIONS	RESULTS	OUTCOMES	IMPACT
MYANMAR	Provide support and technical advice to national government. Improve data on population status and utilisation of 7 priority families. Work with government to develop spatial tools (e.g. MPAs) that prioritize shark habitat. Proactively engage with small-scale fishing communities in 2 seascapes.	NPOA for sharks ratified by 2022. Reports prepared on shark ecology and shark-dependent livelihoods by 2023 and annually thereafter. Appropriate protection in place for threatened species by 2026. Spatial protections (e.g. MPAs) designated and effectively implemented in critical shark habitats by 2030. Fishers have improved awareness and understanding of the importance of sharks for ecosystem function by 2030.	Key shark and ray habitats are protected and effectively managed by 2030. Measurable declines in fishing, bycatch and trade activities for 7 priority families by 2030.	Shark populations remain stable or increase by 2030 vs. 2020 baseline. Shark-dependent fishers report similar or improved levels of wellbeing despite shark conservation measures from 2020-2030.
PAPUA NEW GUINEA	Conduct education and awareness programme in >100 communities in New Ireland Province. Conduct socio-economic research on perceptions of sawfish, wedgefish, and guitarfish in >100 communities in New Ireland Province. Conduct socio-ecological research to understand distribution and diversity of sharks and rays. Conduct community and stakeholder meetings and trainings on shark and ray spatial management in MPA locations in New Ireland Province.	Improved understanding of local ecological knowledge and socio-economic dependence on sharks in >70 communities in New Ireland Province by 2027. Time series of ecological data on shark/ray abundance and diversity for 2020-30. Improved awareness of and support for shark conservation in >100 communities in New Ireland Province by 2025. Sawfish, wedgefish, and guitarfish protections established in 2 MPAs by 2022, which are implemented with local laws by 2024. First nation-wide sawfish and rhino ray protection legislation established by 2030.	Catch and trade of sawfish, wedgefish, and guitarfish declining in New Ireland Province by 2027, relative to 2019 baseline. Evidence of reduced catch and trade of sawfish and wedgefish in other parts of PNG by 2030.	Sawfish, wedgefish, and guitarfish populations stable or increasing in New Ireland by 2030, vs. 2017 baseline. Stable or increasing populations of sharks in Murat MPA, vs. 2017 baseline. Lessons applied to other provinces, with similar models adopted elsewhere by 2030.

	ACTIONS	RESULTS	OUTCOMES	IMPACT
SINGAPORE	Improve evidence base on trade and utilization of CITES-listed and CR species. Support CITES implementation through technical capacity development for monitoring trade. Proactive engagement with governments, merchant, fisher, and consumer groups.	>1 report(s) published annually on the state of shark trade in Singapore. Enhanced legal protection of CITES-listed and CR species, with strengthened labeling requirements for seafood products by 2025. Increased awareness among the fish merchants of illegality of trade (without permits) in CITES-listed species by 2022. >50% of fish merchants adopting responsible trade practices by 2030. Increased adoption of sustainable fishing guidelines within the angling community by 2025.	90% reduction in occurrence of CITES-listed sharks in domestic trade and consumption by 2030, vs. 2019 baseline.	Evidence of population stability and/or recovery for CITES-listed species in key supply-side countries (e.g. Indonesia and Malaysia) by 2030 vs. 2019 baseline.
SOUTHERN CONE	Collect data on catch and trade of imperiled sharks. Conduct social media activities and campaigns to conserve threatened sharks, with focus on imperiled endemics. Proactively engage with governments to develop spatial measures for threatened species in 2 countries and implement Regional Recovery Plan for CR sand tiger population. Engage anglers in Argentina and Uruguay in a tagging program including best catch-and-release practices.	2 coastal shark corridors for threatened species developed by 2027. Regional Recovery Plan for sand tiger population finalized by 2021 and fully implemented by 2023. Two management plans (Bahía San Blas MPA and Rio Negro) with shark-specific measures finalized and delivered to local authorities by 2021. Critical habitat for imperiled sharks identified and proposed for protection by 2025 2 sustainable haul gear systems piloted in Uruguay and Argentina, with adoption in 50-70% of small-scale fishing ports by 2028. Time series data on catch and trade of imperiled shark species from small-scale fisheries sites in Uruguay for 2020-2025.	Bony fish catches increase and bycatch ratios decrease in small-scale fisheries in Uruguay and Argentina by 2030, vs. 2019 baseline. Fishing mortality of coastal sharks in Río Negro declines by 50% by 2025. All target and by-catch mortality and from small-scale fishing of smooth-hound and angel sharks declines by 50% by 2030 in Argentina and Uruguay, vs. baseline 2019.	Population declines of imperiled coastal sharks are halted in Uruguay and Argentina by 2030, vs. 2019 baseline. Income and well-being of project-affected small-scale fishers improves via increased catches of valuable bony fish by 2030, vs. 2019 baseline.

	ACTIONS	RESULTS	OUTCOMES	IMPACT
SW INDIAN OCEAN	Propose species to national governments and Nairobi Convention, which warrant stricter protection at national/regional levels. Engage 4 national governments and Regional Seas Program in policy reform and capacity building. Conduct/support marine spatial planning processes and improvement of MPA effectiveness. Provide outreach and training for best-practice fisheries practices with 4 governments and 6 fishing communities. Proactively engage with 3 communities for community-led shark management. Improve monitoring and data collection.	All endangered and CITES-listed species under some form of national management in 4 SWIO countries by 2025, with CMS Appendix I and IOTC-prohibited species protected in 2 countries. NDF development for all CITES Appendix II species, in 3 countries, by 2026. Spatial management plans in 2 countries include measures for threatened sharks by 2025. 3 community conservation initiatives incorporate shark-specific measures by 2025. In-house data collection systems in place within 2 government agencies by 2025. Mitigation hierarchy for bycatch trialed in 1 country/commercial fishery by 2030.	Measurable decline in trade volumes of CITES-listed and threatened species by 2028. Sustainable fishing practices resulting from improved local-level management ensure stable catches for local communities by 2030. Fishery-specific restrictions reduce inter-sector conflict, and ensure that subsistence and artisanal fishers retain access to resources, with maintained or improved well-being in artisanal fisher communities from 2020-30. Catch rates of non-threatened shark species remain stable in three countries, between 2019 baseline and 2026.	Improved conservation status of WIO chondrichthyan species by 2030. Decreased number of WIO chondrichthyan species classified as threatened on IUCN Red List by 2030. Well-being of project-affected communities is maintained or improved from 2020-30, vs. 2019 baseline.

Associated project —multilateral framework building for sharks	Continue to drive policy change via multilateral commitments. We will focus on work to: a) Work with interested national governments to support proposals to list additional species listings at future CITES CoPs b) Work with interested national governments to drive compliance measures within CITES, to ensure listed species are traded at sustainable levels c) Develop and deliver global tools and guidance to support implementation of CITES for all current and potentially future listed species d) Scale up WCS engagement in relevant RFMO's, RFB's and RSP's along with CMS, to progress shark conservation and management in these fora e) Look to develop partnership with governments and intergovernmental institutions to progress shark conservation action as it becomes an institutional priority globally as a result of increasing multilateral commitments

LIST OF ACRONYMS

CBD: Convention on Biological Diversity
CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS: Convention on Migratory Species
CoP: Conference of the Parties
CR: Critically Endangered (as per the IUCN Red List of Threatened Species)
DD: Data Deficient (as per the IUCN Red List of Threatened Species)
EN: Endangered (as per the IUCN Red List of Threatened Species)
FAD: Fisheries Aggregation Device
FMP: Fisheries Management Plan
GSRI: Global Shark and Ray Initiative
IOTC: Indian Ocean Tuna Commission
IUCN: International Union for Conservation of Nature
IPOA: International Plan of Action
MA: Management Authority
NGO: Non-governmental organization
NDF: Non-Detriment Finding
NPOA: National Plan of Action
RFB: Regional Fisheries Body
RFMO: Regional Fisheries Management Organization
RSC: Regional Seas Convention
RSP: Regional Seas Programs
WCS: Wildlife Conservation Society