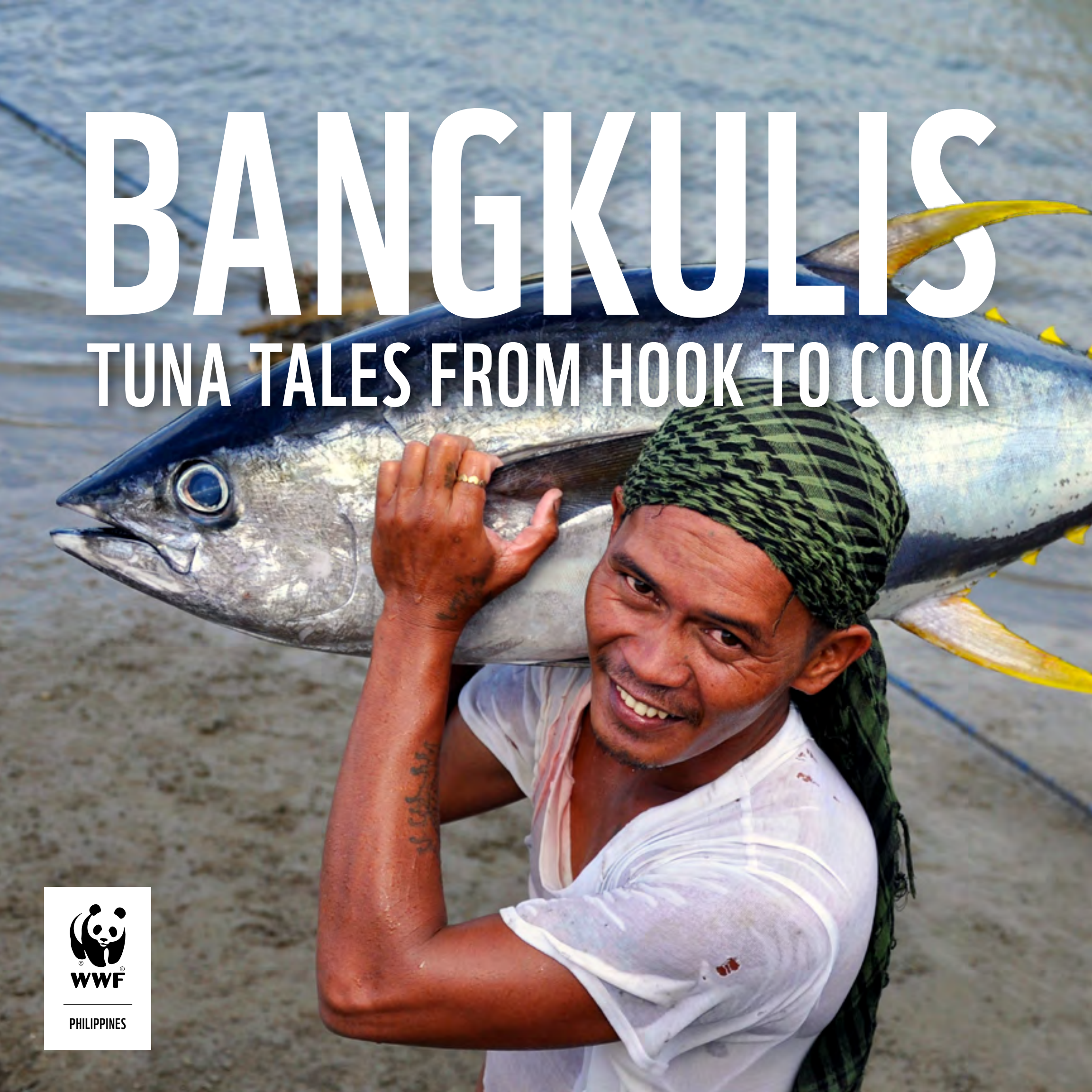
BANGKULIS

TUNA TALES FROM HOOK TO COOK



WWF

PHILIPPINES


Calm seas never made a good sailor.
~ Franklin D. Roosevelt

MESSAGE FROM THE BUREAU OF FISHERIES AND AQUATIC RESOURCES (BFAR)

The Department of Agriculture's Bureau of Fisheries and Aquatic Resources (DA-BFAR) and the World Wide Fund for Nature (WWF) formally present *Bangkulis: Tuna Tales from Hook to Cook*, a coffeetable book that showcases the accomplishments of the Sustainable Tuna Partnership Programme, a collaborative project that promotes sustainable tuna fisheries at the community level in select fishing grounds of the country.

As we all know, tuna is one of the most important fish commodities caught in our rich marine waters. In order to protect and properly manage these high value fish, DA-BFAR and its partners in the fisheries sector have crafted and implemented policies and programmes such as the National Tuna Management Plan and the Fisheries Management Areas (FMA) to comprehensively address the challenges that plague not only the tuna industry but more importantly, Philippine fisheries as a whole.

Collaborative projects like the Sustainable Tuna Partnership are much needed now to sustain our tuna fisheries productivity at the community level. *Bangkulis: Tuna Tales from Hook to Cook* will give its readers information and insights into the project while providing facts about Philippine artisanal fisheries and its role in the sustainability of tuna and tuna-like species. True to its title, the publication also features community-led postharvest technologies for tuna processing, highlighting the need to ensure not only sustainability in catching tuna but also the viability of its value chain to drive economic growth in fishing communities.

This coffeetable book covers programme highlights, fisheries-related stories and success stories in an engaging layout, characterized by high-quality photos from the field. This presentation can inspire the general audience to put the project in context with what is happening on the ground.

We thank WWF–Philippines for spearheading this relevant project and for coming up with this timely publication. We hope that projects like the Sustainable Tuna Partnership will continue to steer the country's fisheries industry to greater heights – towards a food secure and resilient Philippines with prosperous fisherfolk.

Mabuhay ang sektor ng pangisdaan!

Commodore Eduardo Gongona, PCG (Ret.)
BFAR National Director

MESSAGE FROM THE EXECUTIVE DIRECTOR

Our nation has long depended on our seas. Many of us, particularly our 1.9 million small-scale fishers and their families, have built their lives on what the ocean has to offer. So much of our history, our cultural identity, is linked to being an archipelago, and a maritime country. For our tuna fishers the ocean is life, and we are all humbled by the continued efforts of our partner fishing communities in ensuring that their fisheries will be healthy for generations to come.

Our oceans face numerous pressures. Illegal, unreported and unregulated fishing, as well as the overharvesting of fish, have left many fisheries on the brink of collapse, while the ongoing degradation of our ecosystems challenges their ability to recover. In recent years we have begun to unravel the impacts of the climate crisis on the world's fisheries. The clearest lesson is that life is not an equation of economics and nature. Causing nature to fail is not development but collapse.

Through partnerships big and small, WWF has pursued the protection of our precious waters. Governments, businesses, consumers, fishers – all have important roles to play in caring for the ocean. The fishers of the Lagonoy Gulf and Mindoro Strait have been great leaders of conservation throughout our engagement with them. They are passionate, open-minded advocates, good stewards who speak out and take action for the sustainable use of our fisheries.

This book is dedicated to our partner communities, serving as a chronicle of their hard work and persistence to achieve real economic and environmental sustainability. WWF will continue this journey, hand-in-hand with our partner fishers as we seek ever-better ways for people and nature to thrive together.

I am truly proud of all those who have been part of this journey, and grateful for all the support that has made our progress possible. This book tells a story of hope, showing how communities in the Lagonoy Gulf and Mindoro Strait have worked to change the ending for our oceans, our country, our people, and our environment. It is a story that has not yet ended, the rest remains in all our hands.

Together responsible,

Katherine Custodio
WWF-Philippines Executive Director

THE YELLOW CARD AND THE YELLOWFIN

FOREWORD by
Joann Pepino Binondo
Overall Manager, WWF Sustainable Tuna Fisheries Projects

Pinoys have always been people of the sea. For thousands of years, our artisanal fishers have braved the *amihan* and *habagat* to bring home fish for their families.

Things changed in the 1960s, when global demand for high-grade seafood like yellowfin tuna rose. Commercial fishing boats, each capable of finding and scooping up entire schools of fish, scoured the oceans. Longlines brimming with thousands of baited hooks unintentionally caught and killed untold thousands of sharks, sea turtles, cetaceans and other protected species. Even artisanal fishers started using destructive dynamite and cyanide to catch fish faster. Because the ocean seemed so incredibly massive, people thought its bounty was unlimited. They were wrong.

Today Pinoys are catching fewer fish than ever, many of them juveniles which were never given a chance to spawn. The Bureau of Fisheries estimates that 10 of the country's 13 major fishing grounds are overfished.

It took a warning to finally turn the tide. In June 2014, the European Union (EU) issued the Philippines a yellow card for failing to control illegal, unreported and unregulated (IUU) fishing – a precursor to a red card, equivalent to an eventual importation ban for all Philippine seafood products.

The EU is the world's largest seafood importer, importing PHP 9.4 billion worth of seafood from the Philippines in 2013. Vowing to source seafood only from sustainable sources, the EU sanctions nations which continuously ignore international fishing standards.

The Bureau of Fisheries (BFAR), the agency under the Department of Agriculture (DA) responsible for managing the country's aquatic resources, was tasked with amending the country's fisheries code, unchanged since 1998.

Recognizing an excellent opportunity to work more closely with the government while promoting sustainable fisheries, the World Wide Fund for Nature (WWF) joined a coalition of Nongovernment Organizations to review and propose amendments to the country's aging fisheries code.

Our team at WWF has been pioneering community-led initiatives to sustainably transform artisanal tuna fisheries in Bicol's Lagonoy Gulf and the coast of Mindoro since 2011. Our plan was for local communities to supply 100% sustainably-caught tuna, and to achieve Marine Stewardship Council (MSC) certification as an important milestone in our journey towards sustainable seafood. The project aimed to have local communities identify and address the myriad issues confronting tuna fisheries – including stock sustainability, livelihood impacts and enhanced governance.

After over a decade of working with WWF, the yellowfin fishing communities of the Lagonoy Gulf and Mindoro Strait have since become models for community-led sustainable fisheries programmes. It has been a fulfilling and life-changing experience for me as a community development advocate, because we succeeded in empowering our tuna fishing communities to have a greater pull in the supply chain while bolstering their position in fisheries governance.

The challenges were quite hefty when we started our intervention in 2011. The communities lacked environmental awareness and were not organized. Collaboration among artisanal and commercial tuna stakeholders, scientists, the government, academe and the general public were woefully lacking. There was mistrust because of priority clashes – most fishers just wanted to catch more tuna, traders sought higher profits and some leaders were motivated solely by political gain.

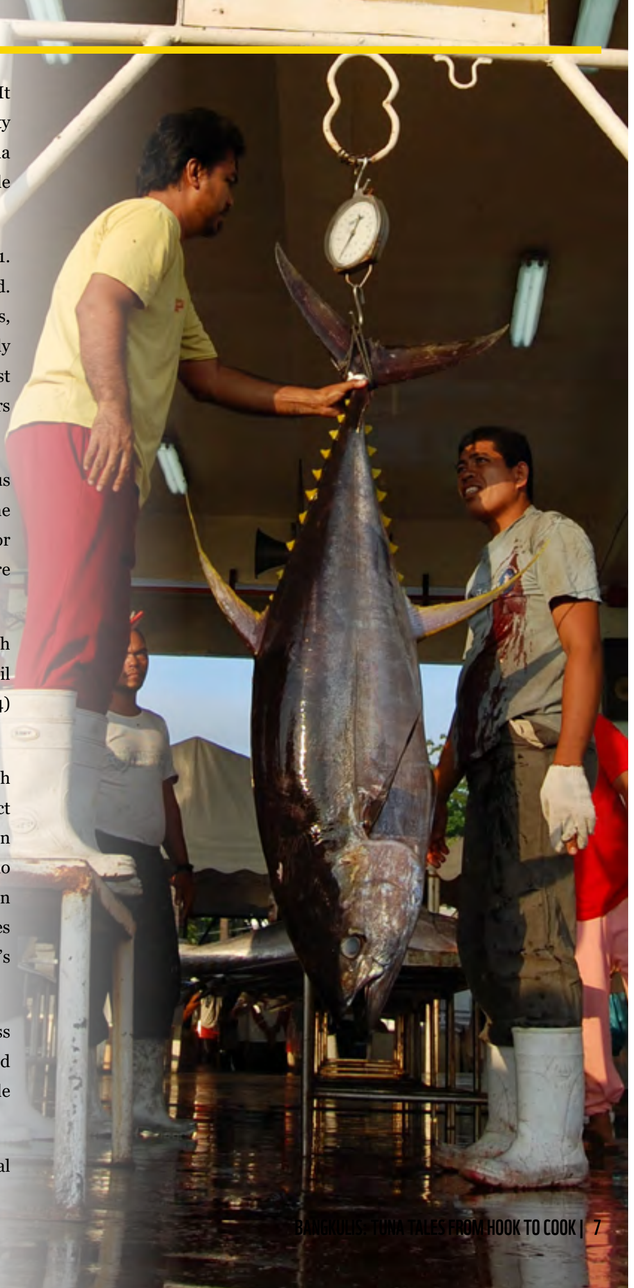
The lack of confidence and cooperation among supply chain actors, plus the absence of alternative livelihood opportunities drastically limited the options of artisanal fishers and their families to negotiate fair prices for their fish. This led to vicious cycles of debt, settled only by catching more and more tuna, which in turn fueled overfishing.

Most of these challenges were eventually surmounted, usually through creative means. The yellow card given by the EU was finally lifted in April 2015 and the Amended Fisheries Code of the Philippines (RA 10654) passed into law – but our work continues.

This coffeetable book, *Bangkulis*, is named after the yellowfin tuna, a fish which has buoyed the livelihoods of thousands of Pinoys. In the dialect of the Sagnay people of Bicol, *Bangkulis* has always meant the yellowfin tuna and the promise that fishing for it brings. Authored by people who have been with us from the very beginning, our book shares two dozen tuna tales to share the lessons we learned in implementing our fisheries improvement project, while painting a colorful narrative of the country's first MSC-certified fishery.

We thank all our partners and stakeholders for a decade of progress and hope that this book can inspire other fishery managers and community development practitioners to continue promoting sustainable development.

We invite you to get your feet wet and help transform more coastal communities with us.



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FROM HOOK TO COOK

Shooting through the oceans like sleek silver torpedoes, tuna are among the world's most valuable fish, accounting for nearly a tenth of global seafood demand.

The Philippines forms the apex of the Coral Triangle, Earth's richest region in terms of marine biodiversity, so it's no surprise that it's also the planet's third largest tuna producer. Almost half of the country's seafood exports are comprised of skipjack, frigate, bigeye and yellowfin tuna. In 2014, the Philippines exported 117,909 metric tonnes of tuna, valued then at PHP19.5 billion.

These silver fish buoy the livelihoods of millions of people, especially artisanal handline fishers.

The global gold rush for tuna began in the 1970s, when *sushi* became popular. Japanese traders tapped the Philippines for *sashimi*-grade yellowfin tuna, and they were willing to pay well. So it was that local tuna fishing fleets were born, while tuna landing and processing hubs like General Santos City flourished.

But international demand kept rising – and tuna could only spawn so fast. Eventually the seas started looking a bit emptier. Fishing boats ranged further and further to pursue their quarry.

Tuna fishers who regularly hauled in giant yellowfin tuna in the 1980s and 1990s are now catching much smaller fish, with more and more boats returning empty. Catches have decreased by 75% from the 1990s. Around 87% of yellowfin tuna landings are now juveniles weighing under three kilogrammes.

Though the Philippine economy is growing, the country's two million fisherfolk are trailing behind, with 40% living below the poverty line.

To prevent a total crash in tuna stocks and to ensure artisanal fishers stay afloat, the World Wide Fund for Nature (WWF) came up with a series of innovative projects. Spanning over a decade, they would eventually transform the way tuna are caught.

PROMOTING SUSTAINABLE TUNA FISHERIES IN BICOL AND MINDORO

Launched in 2011 to help secure the livelihoods of small-scale tuna fishers in Bicol and Mindoro, WWF's Partnership Programme Towards Sustainable Tuna (PPTST) worked to provide fishers with long-term market access by connecting them with European importers searching for sustainably-caught seafood.

The project was a Fisheries Improvement Project (FIP) which heavily promoted responsible and science-based fisheries management by empowering fishers using selective fishing gear such as handline reels and circle hooks. These types of gear ensure that only a single adult tuna is caught at a time and that the unintentional bycatch of other types of marine life like sea turtles is minimized.

Fishers were also taught to improve the handling and processing of landed fish to enhance meat quality and marketability. WWF and its allies also helped establish local fishing federations, associations, regulations and management plans. The voices of tuna fishers were amplified to local, regional and national levels.

The project's initial aim was to help local fishers secure Marine Stewardship Council (MSC) certification, a globally-recognized standard for wild-caught seafood ecolabels. After a lengthy decade-long process, the two fisheries finally secured the MSC ecolabel in 2021.

While the PPTST project ended in 2017, WWF continued its interventions through the Sustainable Tuna Partnership (STP). STP built on the achievements of PPTST by helping fishers develop financial management and business skills, while augmenting their income through social enterprises, giving fishers greater power to negotiate for fairer tuna prices. STP reached out to traders, exporters and retailers by giving tuna fishers greater influence along the supply chain.

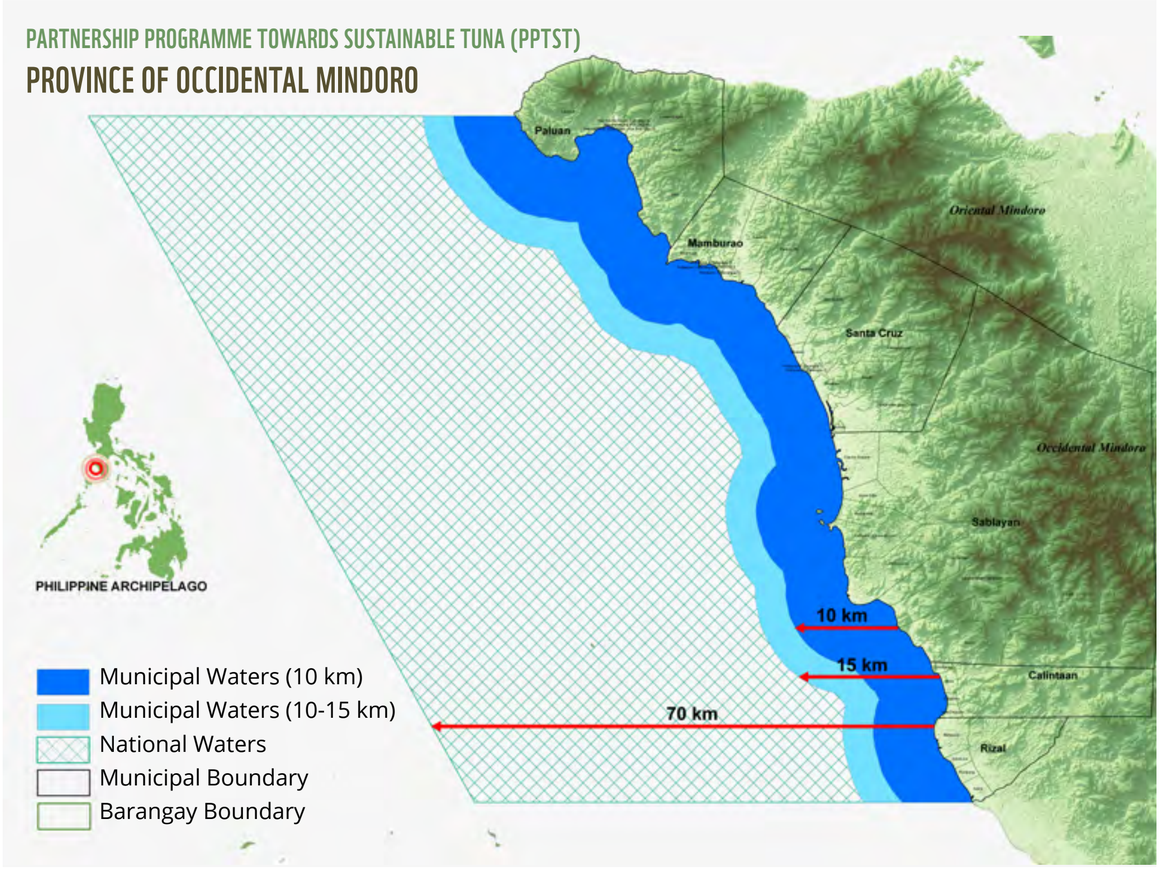
Together with Fisheries and Aquatic Resource Management Councils (FARMCs), Tuna Fishers Associations (TFAs), local government units, national government agencies, the German Development Bank, WWF-Germany, the Tambuyog Development Center and supply chain actors like Bell/Coop and Seafresh, WWF continues over a decade of work to leave a lasting legacy for tuna fisheries across the Philippines.

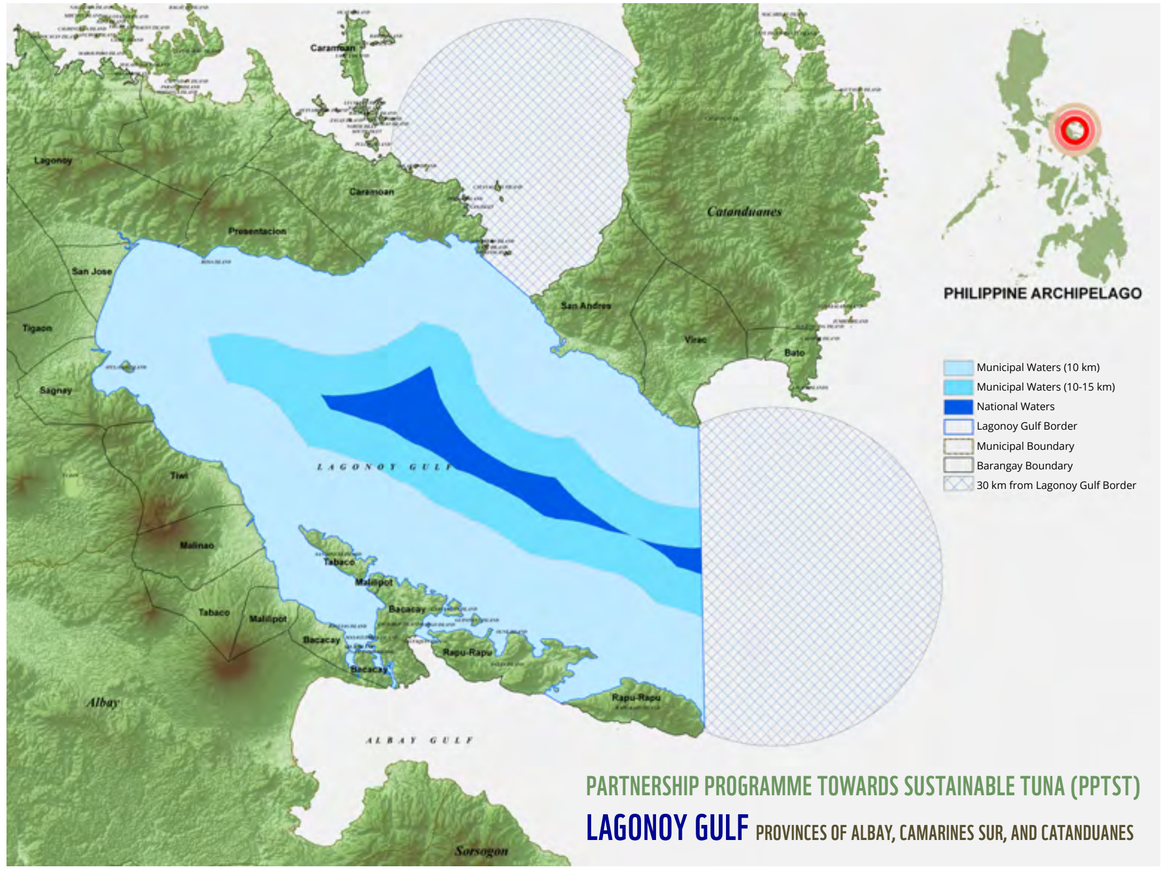
PROJECT SITES

From 2011 to 2021, WWF worked with over 6000 fishers in 21 municipalities covering the Lagonoy Gulf, in the Bicol Peninsula in Luzon, plus the Mindoro Strait, which connects the West Philippine Sea with the Sulu Sea.

The Mindoro Strait is a corridor linking the West Philippine Sea, Verde Island Passage and Sulu Sea. As a corridor which connects three productive seas, it is a natural pathway of many tuna species. The area covers approximately 9735 square kilometers. Fishing is conducted year round by over 1000 tuna boats, with the lean season covering the months of November to May. WWF has worked with 28 fishing villages in the six municipalities dotting the west coast of Occidental Mindoro.

The Lagonoy Gulf is one of the most productive fishing zones bordering the east coast of the Philippines. An important spawning ground for yellowfin tuna, the Gulf covers an area of approximately 3700 square kilometres and is up to 1200 meters deep. Tuna fishing is conducted year round by around 1700 small boats, with the lean season spanning from July to December. Over 700,000 people live in the area. WWF has worked with 112 fishing villages in the 15 municipalities surrounding the Gulf.





WHAT ARE TUNA?

If fish were cars, then tuna would be the Ferraris of the sea. Ranging in size from the 1.5-foot bullet tuna to the gigantic 15-foot Atlantic bluefin, tuna are bullet-shaped predatory pelagic fish that swim through the world's oceans.

Tuna belong to the family Scombridae, which also include mackerels and bonitos. Their meat is especially red and juicy because of large amounts of myoglobin, which allows them to supercharge their muscles with oxygen, letting them swim over 70 kilometres per hour. Some of the larger tuna species like bluefin are warm blooded, enabling them to live in cooler waters and survive a wider range of circumstances.

Though harvested in the waters of over 80 nations, the Philippines, one of the richest countries in terms of marine biodiversity, is the world's third largest tuna producer. Tuna provide good incomes for fisherfolk while generating thousands of jobs in vessels, canneries and other segments of the supply chain.

In recent years though, the rising number of fishers and large fishing vessels targeting these fish have depleted stocks, putting the livelihoods of Filipino fishers and other tuna sector workers at risk. In particular, the unregulated use of giant nets called purse seines and proliferation of floating aggregation devices called *payaw* are fast sundering stocks. Many of the country's tuna fisheries are severely overfished, and only community-led and science-based intervention can make the industry sustainable. Here are the country's most economically-important scombrids.

PHILIPPINES' MOST ECONOMICALLY-IMPORTANT SCOMBRIDS

Pacific Bluefin Tuna	*Thunnus orientalis*	*Tuna*	3.0m
Bigeye Tuna	*Thunnus obesus*	*Bariles*	2.5m
Yellowfin Tuna	*Thunnus albacares*	*Bangkulis*	2.4m
Dogtooth Tuna	*Gymnosarda unicolor*	*Tambakol*	2.4m
Long-tailed Tuna	*Thunnus tonggol*	*Sobad*	1.45m
Albacore	*Thunnus alalunga*	*Albakora*	1.4m
Skipjack Tuna	*Katsuwonus pelamis*	*Tambakol*	1.1m
Kawakawa	*Euthynnus affinis*	*Kutsarita*	1.0m
Frigate Tuna	*Auxis thazard*	*Mangko*	0.65m
Bullet Tuna	*Auxis rochei*	*Tulingan*	0.5m
Spanish Mackerel	*Scomberomorus guttatus*	*Tangigue*	0.76m
Common Dolphinfish	*Coryphaena hippurus*	*Mahi-Mahi*	2.1m

Pacific bluefin tuna

Thunnus orientalis | Temminck & Schlegel 1844

Maximum Size	3.0m (300cm) with tail
Maximum Weight	450kg
Lifespan	30 years
Environment	Pelagic; oceanodromous; brackish; marine
Climate	Subtropical; 52°n - 46°s, 112°e - 117°w
Importance	Fisheries, highly-commercial, aquaculture, very expensive commercial game-fish
Resilience	Low, minimum population doubling time 4.5 - 14 years
Red List Status	Near Threatened
Distribution	North Pacific: Gulf of Alaska to southern California and Baja California and from Sakhalin Island in the southern Sea of Okhotsk south to northern Philippines. There are four substantiated records of this subspecies in the southern hemisphere: off Western Australia, southeast Pacific and Papua.
Morphology	Mean number of gill rakers 35.9. First ventrally-directed parapophysis on vertebra number 8. Dorsal wall of body cavity has a narrow bulge with lateral concavity and wide lateral trough.
Biology	Epipelagic, usually oceanic, but seasonally coming close to shore. Tolerates ample temperature intervals. Forms schools by size, sometimes with other scombrids. Migrates between June and September in a northward direction along the coast of Baja California, Mexico and California. A voracious predator that feeds on a wide variety of small schooling fishes or squids, also crabs and less sessile organisms. Marketed fresh and frozen.

Bigeye tuna

Thunnus obesus | Lowe 1839

Maximum Size	2.5m (250cm) with tail
Maximum Weight	210kg
Lifespan	11 years
Environment	Pelagic; oceanodromous; brackish; marine, depth range 0 – 250m
Climate	Subtropical; 13 – 29°C; 45°N - 43°S, 180°W - 180°E
Importance	Fisheries: highly commercial expensive game fish
Resilience	Medium, minimum population doubling time 1.4 - 4.4 years
Vulnerability	High
Red List Status	Vulnerable (VU)
Distribution	Atlantic, Indian and Pacific: in tropical and subtropical waters. Absent in the Mediterranean. Highly migratory.
Morphology	Dorsal spines (total): 13 - 14; Dorsal soft rays (total): 14 - 15; Anal spines: 0; Anal soft rays: 14; Vertebrae: 39. A large species, deepest near the middle of the first dorsal fin base. Lower sides and belly whitish; a lateral iridescent blue band runs along the sides in live specimens. The first dorsal fin is deep yellow, the second dorsal and anal fins are light yellow, finlets are bright yellow edged with black.
Biology	Occur in areas where water temperatures range from 13°-29°C, but the optimum is between 17° and 22°C. Variation in occurrence is closely related to seasonal and climatic changes in surface temperature and thermocline. Juveniles and small adults school at the surface in mono-species groups or mixed with other tunas, may be associated with floating objects. Adults stay in deeper waters. Eggs and larvae are pelagic. Feed on a wide variety of fishes, cephalopods and crustaceans during the day and at night. Meat is highly prized and processed into *sashimi* in Japan. Marketed mainly canned or frozen but also sold fresh.

Yellowfin tuna

Thunnus albacares | Bonnaterre 1788

Maximum Size	2.4m (240cm) with tail
Maximum Weight	200kg
Lifespan	8 years
Environment	Pelagic; oceanodromous, brackish, marine, depth range 1 – 250m
Climate	Tropical; 15 – 31°C; 52°N - 45°S, 180°W - 180°E
Importance	Commercial fisheries and expensive gamefish
Resilience	Medium, minimum population doubling time 1.4 - 4.4 years
Vulnerability	Moderate to high vulnerability
Red List Status	Least Concern
Distribution	Worldwide in tropical and subtropical seas, absent from Mediterranean Sea. Highly migratory.
Morphology	Dorsal spines (total): 11 - 14; Dorsal soft rays (total): 12 - 16; Anal spines: 0; Anal soft rays: 11 – 16; Vertebrae: 39. Fish with very long second dorsal fin and anal fin, which in some may reach well over 20% of the FL. The pectoral fin is moderately long, usually reaching beyond the second dorsal fin origin but not beyond the end of its base. Color is black metallic dark blue changing through yellow to silver on the belly. The belly frequently has about 20 broken, nearly vertical lines. Dorsal and anal fins and finlets bright yellow.
Biology	An oceanic species occurring above and below the thermoclines. Pelagic in open water, but rarely seen near reefs. They school primarily by size, either in monospecific or multi-species groups. Larger fish frequently school with porpoises, also associated with floating debris and other objects. Feed on fishes, crustaceans and squids. Batch spawners. Sensitive to low concentrations of oxygen and therefore not usually caught below 250m in the tropics. Peak spawning occurs during the summer, in batches. Encircling nets are employed to catch schools near the surface. Marketed mainly frozen and canned but also fresh and smoked. Highly valued for *sashimi*.

Dogtooth tuna

Gymnosarda unicolor | Ruppell 1836

Maximum Size	2.48m (248cm) with tail
Maximum Weight	131kg
Environment	Reef-associated; oceanodromous, marine, depth range 10 – 100m
Climate	Tropical; 20 – 28°C; 31°N - 30°S, 32°e - 130°w
Importance	Minor commercial fisheries and expensive gamefish
Resilience	Low, minimum population doubling time 4.5 - 14 years
Vulnerability	Moderate to high vulnerability
Red List Status	Not in ICUN Red List
Distribution	Indo-Pacific: Red Sea and East Africa to Polynesia, north to Japan, south to Australia.
Morphology	Dorsal spines (total): 13 - 15; Dorsal soft rays (total): 12 - 14; Anal spines: 0; Anal soft rays: 12 – 13; Vertebrae: 38. Mouth fairly large, upper jaw reaching to middle of eye. Laminae of olfactory rosette 48 to 56. Interpelvic process large and single. Lateral line strongly undulating. Body naked posterior to corselet. Swim bladder large, spleen visible in ventral view on the right side of the body. The back and upper sides brilliant blue-black, lower sides and belly silvery; no lines, spots or other markings on the body.
Biology	An offshore species found mainly around coral reefs. Generally solitary or occur in small schools of six or less. Preys on small schooling fishes such as Decapterus, Caesio, Nasio, Cirrhilabrus, Pterocaesio and squids. Marketed canned and frozen.

Long-tailed tuna

Thunnus tonggol | Bleeker 1851

Maximum Size	1.45m (145cm) with tail
Maximum Weight	40kg
Environment	Pelagic; oceanodromous; marine
Climate	Tropical; 47°n - 33°s, 39°e - 154°e
Importance	Fisheries, highly-commercial, aquaculture, very expensive commercial game-fish
Resilience	Medium, minimum population doubling time 1.4 - 4.4 years
Vulnerability	High to very high vulnerability
Red List Status	Not in ICUN Red List
Distribution	Indo-West Pacific: Red Sea and East Africa to New Guinea, Japan, south to Australia. Morphology: Vertebrae: 39. A small species, deepest near the middle of the first dorsal fin base. The second dorsal fin is higher than the first dorsal fin; the pectoral fins are short to moderately long; swim bladder is absent or rudimentary. Lower sides and belly silvery white with colorless elongate oval spots arranged in horizontally oriented rows. The dorsal, pectoral and pelvic fins are blackish; the tip of the second dorsal and anal fins are washed with yellow; the anal fin is silvery; the dorsal and anal finlets are yellow with grayish margins; the caudal fin is blackish, with streaks of yellow green.
Biology	Predominantly neritic species avoiding very turbid waters and areas with reduced salinity such as estuaries. May form schools of varying size. Feeds on a variety of fishes, cephalopods, and crustaceans, particularly stomatopod larvae and prawns. Marketed mainly fresh and dried salted, but also smoked, canned and frozen.

Albacore

Thunnus alalunga | Bonnaterre 1788

Maximum Size	1.4m (140cm) with tail
Maximum Weight	60kg
Environment	Pelagic; oceanodromous, marine; depth range 0 – 600 m
Climate	Subtropical; 10 – 25°C; 59°N - 46°S, 180°W - 180°E
Importance	Commercial Fisheries and Expensive Gamefish
Resilience	Medium, Minimum population doubling time 1.4 - 4.4 years
Red List Status	Least Concern
Distribution	Cosmopolitan in tropical and temperate waters of all oceans including the Mediterranean Sea but not at the surface between 10°N and 10°S. Western Pacific: range extends in a broad band between 40°N and 40°S. Often confused with juvenile Thunnus obesus which also have very long pectorals but with rounded tips. Highly migratory.
Morphology	Total dorsal spines: 11 - 14; Total dorsal soft rays: 12 - 16; Total anal spines: 0; Total anal soft rays: 11 – 16. Anterior spines much higher than posterior spines giving the fin a strongly concave outline. Interpelvic process small and bifid. Body with very small scales. Pectoral fins remarkably long, about 30% of fork length or longer in 50 cm or longer fish.
Biology	An epipelagic and mesopelagic, oceanic species, abundant in surface waters of 15.6° to 19.4°C; deeper swimming, large albacore are found in waters of 13.5° to 25.2°C; temperatures as low as 9.5°C may be tolerated for short periods. Known to concentrate along thermal discontinuities. Form mixed schools with skipjack tuna (Katsuwonus pelamis), yellowfin tuna (Thunnus albacares) and bluefin tuna (T. maccoyii), schools may be associated with floating objects, including sargassum weeds. Feed on fishes, crustaceans and squid. Highly-appreciated and marketed fresh, smoked, deep frozen or canned. Eaten steamed, broiled, fried and microwaved. Sexual maturity reached at 90 cm.

Skipjack tuna

Katsuwonus pelamis | Linnaeus 1758

Maximum Size	1.1m (110cm) with tail
Maximum Weight	35kg
Lifespan	12 years
Environment	Pelagic; oceanodromous; marine, depth of 0-260m
Climate	Tropical, 15 – 30°C; 58°N - 47°S, 180°W - 180°E
Importance	Fisheries, highly-commercial, aquaculture, expensive commercial game-fish
Resilience	Medium, minimum population doubling time 1.4 - 4.4 years
Vulnerability	Moderate vulnerability
Red List Status	Least Concern
Distribution	Cosmopolitan in tropical and warm-temperate waters. Not in eastern Mediterranean. Morphology: Dorsal spines: 14 - 16; Dorsal soft rays: 14 - 15; Anal spines: 0; Anal soft rays: 14 – 15; Vertebrae: 41. Interpelvic process small and bifid. Body without scales except for the corselet and the lateral line. Swim bladder absent. The back is dark purplish blue, lower sides and belly silvery, with 4 to 6 conspicuous longitudinal dark bands which in live specimens may appear as continuous dark blotches.
Biology	Found in offshore waters; larvae restricted to waters with surface temperatures of 15°C to 30°C. Exhibit a strong tendency to school in surface waters with birds, drifting objects, sharks, whales and may show a characteristic behavior like jumping, feeding, foaming, etc. Feed on fishes, crustaceans, cephalopods and mollusks; cannibalism is common. Preyed upon by large pelagic fishes. Also taken by trolling on light tackle using plugs, spoons, feathers, or strip bait. Marketed fresh, frozen or canned; also dried-salted and smoked. Spawns throughout the year in the tropics, eggs released in several portions.

Kawakawa or Little tunny

Euthynnus affinis | Cantor 1849

Maximum Size	1m (100cm) with tail
Maximum Weight	14kg
Environment	Pelagic; oceanodromous; marine, depth of 0-200m
Climate	Tropical; 18 – 29°C; 35°N - 25°S, 40°e - 137°w
Importance	Fisheries, medium-commercial, fair-priced commercial game-fish
Resilience	High, minimum population doubling time less than 15 months
Vulnerability	Moderate to high vulnerability
Red List Status	Not in ICUN Red List
Distribution	Indo-West Pacific: in warm waters including oceanic islands and archipelagos. A few stray specimens have been collected in the Eastern Central Pacific. Highly migratory species.
Morphology	Dorsal spines (total): 11 - 14; Anal spines: 0; Anal soft rays: 13 – 14; Vertebrae: 39. Swim bladder absent. No trace of vertebral protuberances. Anterior spines of first dorsal fin much higher than those mid-way. Interpelvic process small and bifid. Body naked except for corselet and lateral line. Posterior portion of the back with a pattern of broken oblique stripes.
Biology	Occurs in open waters but always remains close to the shoreline. The young may enter bays and harbors. Forms multi-species schools by size with other scombrid species comprising from 100 to over 5,000 individuals. A highly opportunistic predator feeding indiscriminately on small fishes, especially on clupeoids and atherinids; also on squids, crustaceans and zooplankton. Generally marketed canned and frozen; also utilized dried, salted, smoked and fresh.

Frigate tuna

Auxis thazard | Risso 1810

Maximum Size	0.65m (65cm) with tail
Maximum Weight	1.7kg
Maximum Age	5 years
Environment	Pelagic; oceanodromous; marine, depth of 50-Xm
Climate	Tropical, 27 – 28°C; 61°N - 47°S, 180°W - 180°E
Importance	Fisheries, highly-commercial, expensive commercial game-fish
Resilience	High, minimum population doubling time less than 15 months
Vulnerability	Moderate to high vulnerability
Red List Status	Not in ICUN Red List
Distribution	Migratory. Atlantic, Indian and Pacific. Eastern Pacific population recognized as subspecies *Auxis thazard brachydorax*.
Morphology	Dorsal spines (total): 10 - 12; Dorsal soft rays (total): 10 - 13; Anal spines: 0; Anal soft rays: 10 – 14. Back bluish, turning to deep purple or almost black on the head. A pattern of 15 or more narrow, oblique to nearly horizontal, dark wavy lines in scaleless area above lateral line. Belly white. Pectoral and pelvic fins purple, their inner sides black. Body robust, elongate and rounded. Teeth small and conical, in a single series. Pectoral fins short, but reaching past vertical line from anterior margin of scaleless area above corselet. A large single-pointed flap (interpelvic process) between pelvic fins. Body naked except for the corselet, which is well developed and narrow in its posterior part (no more than 5 scales wide under second dorsal-fin origin). A strong central keel on each side of caudal-fin base between 2 smaller keels.
Biology	Epipelagic in neritic and oceanic waters. Feeds on small fish, squids, planktonic crustaceans (megalops), and stomatopod larvae. Because of their abundance, they are considered an important element of the food web, particularly as forage for other species of commercial interest. Preyed upon by larger fishes, including other tunas. Marketed fresh and frozen; also utilized dried or salted, smoked and canned.

Bullet tuna

Auxis rochei rochei | Risso 1810

Maximum Size	0.5m (50cm) with tail
Maximum Weight	2kg
Environment	Pelagic; oceanodromous; brackish, marine, depth of 10-Xm
Climate	15 – 30°C; 58°N - 47°S, 180°W - 180°E
Importance	Fisheries, highly-commercial, expensive commercial game-fish
Resilience	Medium, minimum population doubling time 1.4 - 4.4 years
Vulnerability	Moderate to high vulnerability
Red List Status	Not in ICUN Red List
Distribution	Atlantic, Indian and Pacific: including the Mediterranean Sea. Eastern Pacific population recognized as subspecies *Auxis rochei eudorax*.
Morphology	Dorsal spines (total): 9 - 12; Dorsal soft rays (total): 10 - 13; Anal spines: 0; Anal soft rays: 12 – 14. Back bluish, turning to deep purple or almost black on head. Scaleless area with pattern of 15 or more fairly broad, nearly vertical dark bars. Belly white. Pectoral and pelvic fins purple, their inner sides black. Body robust, elongate and rounded. Teeth small and conical, in a single series. Pectoral fins short, not reaching vertical line from anterior margin of scaleless area above corselet. A large, single-pointed flap (interpelvic process) between pelvic fins. Body naked except for corselet, which is well developed in its posterior part 9more than 6 scales wide under second dorsal-fin origin). A strong central keel on each side of caudal-fin base between 2 smaller keels.
Biology	Adults are principally caught in coastal waters and around islands. Forms schools. Feeds on small fishes, particularly anchovies, crustaceans (especially crab and stomatopod larvae) and squids. Because of their abundance, they are considered an important element of the food web, particularly as forage for other species of commercial interest. Also caught with encircling nets and troll lines. Marketed fresh and frozen and also dried or salted, smoked and canned.

PHILIPPINE FISHING VESSELS

The Philippine fishing fleet is estimated to be over 250,000 vessels strong, consisting mainly of small boats operating in municipal waters, with only 2% being large commercial vessels capable of fishing in the high seas.

Boats displacing under three gross tonnes are considered municipal vessels. Larger craft exceeding three gross tonnes are required by the Amended Fisheries Code of the Philippines (RA 10654) to fish solely beyond an imaginary line drawn 15 kilometers from the nearest body of land.

Tuna fishing vessels employ a wide variety of gear to catch various tuna and scombrid species. Large tuna like yellowfin and bigeye are caught by hook and lines, troll lines, longlines, handlines, ring-nets or purse seines and are then sold fresh or frozen. Smaller tuna like skipjack or even schools of smaller juvenile yellowfin are targeted by purse seines to supply canneries.

Most purse seiners and longliners are based off the southern island of Mindanao, while artisanal handliners pull up tuna from all major fishing areas nationwide. Catches are landed in hundreds of sites throughout the country, with the largest being Navotas fish port in Luzon and General Santos fish complex in Mindanao.

WWF's sustainable tuna project involves some 1700 tuna boats operating in the Lagonoy Gulf and 1000 tuna boats plying the Mindoro Strait, 70% of which have already been licensed and registered.

The Amended Fisheries Code of the Philippines (RA 10654) classifies all fishing boats with a volume of less than three gross tonnes as municipal vessels, while those above three gross tonnes are considered commercial vessels.

Stabilized by bamboo outriggers, Philippine *bangkas* connect the country's fisherfolk to productive fishing areas.

Community members lend a hand dragging a *bangka* back to shore after a night out at sea. The spirit of community burns strong each morning as similar scenes play out across the beach.

YELLOWFIN TUNA HANDLINE FISHERIES

The project wholly supports artisanal handline fishers, who rely on a highly-selective method called handline reel fishing. Fishers use circular reels with a single hook, dropped 50 to 150 meters near floating aggregation devices called *payaw*. Only a single, mature tuna can be caught at a time by the four or five fishers working aboard, some of whom are 'riders' or hired hands.

Compared to commercial purse seiners which target entire tuna schools or tuna longlines rigged with thousands of baited hooks, artisanal fishers catch only a few large tuna per trip. Because handline fisheries have very little bycatch of other species and juvenile tuna, it is considered a more environmentally-sound way of fishing.

Circular handline reels are considered low-impact fishing gear because their hooks only snag large mature tuna. Baitfish like scad, mackerel and other small pelagic fish are utilized to attract large predators like tuna in the open ocean.

A fisherman shows off a large J-hook which can only snag big fish. Circle or C-hooks, with the hook's tips pointed inwards, are better alternatives because they minimize bycatch.

Colourful jigs, bait and lures help attract tuna. Many fishers make their own lures from scrap plastic or rubber to pass the days.

SAVOURING SUSHI: HOW TUNA BECAME THE WORLD'S MOST EXPENSIVE FISH

In 2019, a Japanese *sushi* tycoon bought the most expensive fish in history, a 278-kilogramme Pacific bluefin tuna. The price? P155 million – more than enough to buy four million kilogrammes of rice. Enough to feed 50 people hamburgers every day for the next 50 years.

But did you know that just a few decades ago, tuna of all types were considered trash fish? 'Trash fish' is a fisheries term for low-value fish which are either discarded or dried and turned into fishmeal. Tons of tuna were ground up and turned into cat food. Some of the larger fish were even dumped into landfills!

But in the 1970s, a new delicacy rose to popularity – *sushi*. Made from vinegared rice and raw tuna or other premium slices of seafood, *sushi* became a global phenomenon.

Fuelled by new demand, the International Union for the Conservation of Nature (IUCN) estimates that bluefin fishing levels rose by 2000% in the Western Atlantic from 1970 to 1990. At the same time, tuna prices soared some 10,000%. Connoisseurs paid top peso, dollar, euro and yen for tuna meat – particularly loins – which are sliced into *sashimi* or seared as steaks.

And so it was that tuna became the most expensive fish in the world, proving that the commodification of seafood products drives not just economic growth, but also exploitation. WWF's sustainable fisheries initiatives now work to ensure that people across the globe can continue to savour *sushi* for a long, long time. ■

The rising demand for *sushi* in the 1970s spurred the global gold-rush for bluefin, bigeye and yellowfin tuna.

A pricey but delectable bowl of *tekkadon* at a Japanese restaurant in Manila. Made with fresh slices of yellowfin tuna placed atop chilled *sushi* rice, it is topped with sliced onion leeks and a sour *calamansi* or Philippine lemon.

Chūtoro or medium-grade fatty bluefin tuna slice at the Tsukiji market in Japan. The lowest-grade meat fit for sushi is *akami*, followed by *chūtoro*. Fatty meat called *ōtoro* is the most valuable, retailing for over PHP1000 for three or so tasty but tiny slivers.

Tuna, salmon and kingfish add irresistible taste and texture to *sashimi* (seafood slivers), *maki* (wrapped seafood) and *nigiri* (seafood-topped rice), sold fresh at Japan's Tsukiji market. *Sushi* has since become immensely popular and is served in restaurants and stalls the world over.

The history of *sushi* is shrouded in mystery, but it is believed that over a thousand years ago, Japanese peasants started storing seafood in salted or vinegared rice to prolong shelf-life, especially during summer. The fermented delicacies were offered to the wealthy as *nare zushi* or aged seafood. Generations of experimentation eventually spawned new offerings, including California *maki*. New types of *sushi* are being invented yearly. (**19th Century Print by Horishige**)

FEATURE STORY

ARIA: TRANSFORMING THE TUNA TRADE

by Gregg Yan

"Tuna!" was all I needed to hear to wake up.

It's pitch black and we're on a boat plying the Mindoro Strait for *bangkulis* or yellowfin tuna. It's been 12 wet and cold hours since our *Kapitan* shouted "Aria!" to signal the start of our fishing trip. Around us, three other vessels are using their powerful strobe lights to turn night into day. Everyone furiously pumps circular hand-reels, praying for a bite. The reels are occasionally exchanged for long-handled nets, used to pluck out fast-moving squid lured by the light. It's a colourful carnival in the middle of the sea.

Splash! Our first tuna is landed. It's a handsome 42-kilogramme yellowfin, dazed after being pulled up from the depths. It glitters and gleams in gold and green. When life leaves it, it will turn plain silver.

Our skipper, 60-year old *Kapitan* Johnson Peralta, barks orders. The old man's been fishing since 1971. "Tuna love darkness. The best time to hunt them is when there's no moon," he shares. He's got quite a few mouths to feed – five kids and four grandkids.

For the Philippines, the majority of artisanal tuna fishing takes place at night, when the big fish rise from the depths to feed, especially around simple fish aggregation devices called *payaw*. Artisanal boats usually host three to five fishers, each working a hand-line reel equipped with a single hook. Hired hands are called 'riders' and receive a portion of the profit from each trip. Trips can last anywhere from one night to an entire week.

Artisanal hand-line fishing is an environmentally-friendly way to catch tuna, having been used by fishers for generations. Through this method, a boat carries from two to five fishers, with each dropping a weighted nylon line 100 or so meters deep. Each fisher has a secret formula for attracting the giant fish. On our boat, we use colourful pink lures handcrafted from scrap rubber and plastic, topped off with tiny plastic bags of squid ink. "The more rancid the ink, the better," confides *Kapitan* Peralta.

Soon, we reel in another yellowfin. Employing proper techniques, both fish are hauled aboard and gently placed in a styropor ice-box to preserve meat quality. We head back before the sun rises. The night's fishing is done.

Kapitan Johnson Peralta shows off a circle or C-hook attached to a hand-line reel. Compared with giant purse seines, ring nets and tuna longlines festooned with thousands of baited hooks, these simple devices catch only one fish at a time and have dramatically reduced marine bycatch – the unintended capture of non-targeted species like sea turtles, sharks and rays, which wastes up to 40% of global fishing yields annually.

These squid (*Uroteuthis duvaucelii*) are still alive, having just been plucked from the sea. Attracted at night by powerful strobe lights, they kept whizzing under our boat like tiny crimson torpedoes. A quick eye and steady hand are often enough to catch these ever-present cephalopods, which are either grilled or used as tuna bait, their ink being particularly effective at attracting pelagic predators.

A fisher efficiently fixes the rigging on our *bangka*. We were lucky to have caught not just one, but two *bangkulis*. Other boats fishing near us returned empty-handed.

* * *

One of every five tuna is caught in the Coral Triangle, a six-million kilometre expanse which covers the waters of the Philippines, Indonesia, Malaysia, East Timor, Papua New Guinea and the Solomon Islands. The region is a spawning and nursery area for various tuna species which ply the Pacific, Antarctic and Indian Oceans. The global tuna trade employs millions of people and fuels the economies of entire nations.

Next to Indonesia, the Philippines is Asia's largest tuna exporter. In 2010, it was the Western and Central Pacific Ocean's 7th best tuna generator. The country shipped 106,449 metric tonnes of prime-grade yellowfin, skipjack and other types of tuna to the United States, United Kingdom and Germany in 2010. About 52% of the country's fish exports come from tuna, which are still abundant in the Lagonoy Gulf, Mindoro Strait, Sulu Sea and other parts of the country.

However, rising demand coupled with decades of intensive fishing threatens the country's tuna stocks. "Unless we closely manage and protect remaining populations, the entire Philippine tuna industry might collapse," warns Joann Binondo, overall manager for the Sustainable Tuna Partnership (STP) under the World Wide Fund for Nature (WWF).

Moving proactively, WWF launched the Partnership Programme Towards Sustainable Tuna (PPTST) in 2011, followed by the Sustainable Tuna Partnership (STP) in 2018. These twin Fisheries Improvement Projects (FIPs) aimed to improve yellowfin tuna management practices to benefit over 6000 fishers across 21 municipalities in the provinces of Occidental Mindoro, Albay, Camarines Sur and Catanduanes.

A decade later, the projects helped fishers in the Lagonoy Gulf and Mindoro Strait secure the country's first Marine Stewardship Council (MSC) ecolabel, which is the globally-recognized standard for sustainable wild-capture fisheries and a requisite for regular exports to the European Union (EU).

"We want our country's tuna stocks to last many more generations. Our formula was to increase the value of tuna, rather than convincing people to fish more. We've learned so much since we started 10 years ago and we wish to share our lessons to promote sustainable fisheries in other areas," says Binondo.

WWF's projects not only promoted low-impact fisheries gear and practices like artisanal hand-line fishing, circle hooks, vessel tracking devices or portable ice boxes. The projects helped fishing communities organize themselves while developing their own community-led tuna management plans, ensuring that in this part of the world, the fate of tuna stocks at least partially lie in the hands of communities which benefit from them.

Just as importantly, the project has freed many fishers from vicious cycles of borrowing and relying on middlemen like *casas* and Manila-based exporters to tide them through the lean season, levelling a playing field which for generations has favoured traders instead of the fishers who risk life and limb to rake in the sea's bounty.

Today the tuna fishers of Mindoro and Bicol are starting to reap the rewards of sustainability.

We landed our first *bangkulis* or yellowfin tuna at 4AM, 12 hours after we set sail. Unknown to most people who don't go fishing, many of the plain silver fish we see in the market are actually relatively colourful when alive. The gold and green hues of this struggling tuna can still be seen.

MAKING THE GRADE: PROPER TUNA HANDLING AND GRADING

When it comes to seafood, freshness is key.

This is true not just for food connoisseurs, but for fisherfolk too. After all, premium cuts are worth far more money than inferior meat.

All tuna start out as top-quality fish, but stress, bruises, bleeding and heat exposure can rapidly degrade meat quality and value.

Myoglobin, an oxygen-binding protein, gives tuna meat its distinctive red color – but color fades with heat and stress, which flushes muscles with lactic acid. The tuna industry uses an international grading system to determine the quality and price of each fish.

At the fish grading line, hollow aluminum rods are inserted into each fish. Cored meat shaped like pink noodles are extracted and inspected for color and texture, giving buyers a fair idea of how much to pay for each fish.

Most coveted of all classifications is Grade A, jellylike red loin meat sought by restaurants and food stands for *sushi* and *sashimi*. Grade B is a midgrade meat while Grade C meat sports lighter color and is considered inferior in taste and texture.

"Grade A tuna sells for PHP350 or more per kilo. Grade B goes for PHP260 or so, while light-colored Grade C meat is worth PHP120 or less," explains WWF's Rose Bubuli. Most *casas* and processors buy only Grade A and B meat.

The *sushi* industry concentrates on tuna loins – the meaty fillets or sides of each fish, which comprise about 60% of the body weight of each fish. Grade C meat and other parts like tails, eyes and jaws fuel a different industry and are also sought after.

A hollow aluminum rod is inserted next to a yellowfin tuna's dorsal fin. The rod cores a small noodle-shaped piece of meat to gauge the quality and price of each fish. This fish made the cut. It was Grade A.

As all players in the supply chain benefit more from selling quality tuna, WWF found ways to help fishers retain the high value of their catches.

Special training sessions on proper tuna handling, processing and grading were swiftly organized for WWF's partner fishers.

The race to preserve meat quality starts as soon as a fish bites. It must be reeled up gently and stunned swiftly to minimize stress and unnecessary suffering. A trade secret is proper storage in an ice-filled or otherwise cool catch hold. Skin-to-skin contact is minimized as fishers are mindful of cleanliness and food safety.

Clad in proper gear, a worker carefully cuts a 40-kilo tuna. Cleanliness, food safety and proper technique are paramount to retain meat quality.

"Before we were trained, we didn't know that we weren't supposed to leave fish out in the sun or immersed in water," laughs Elizaldy Boboyo, President of the Tiwi Tuna Fishers' Association.

Fishers who completed proper tuna meat handling sessions were awarded certificates. "It helps that you have a WWF certificate. We could tell the *casa* that we completed official training on meat handling and grading," adds Imelda Belda, herself a former fisher and now Secretary of both the Tabaco TFA and the Tabaco CFARMC in Albay.

The results have been encouraging. "Before WWF's training on tuna meat handling, only about 50% of the tuna landed in our area could be considered good quality," recalls Bernard Mayo, President of the Mamburao Municipal FARMC. "On really hot days, only about 40% of landed fish were good quality, but because of WWF's training, from 80% to 90% of the tuna we see are now good quality."

Domingo Piol, owner of the D & L *casa* with operations all over Occidental Mindoro, agrees. "After the fishers were trained, quality greatly improved. About 80% of the tuna landed in our *casa* are good quality, compared to 50% a few years back."

STRAIGHT BUYING VERSUS QUALITY BUYING

Fishers were also taught to grade tuna meat to finally free them from a system called straight buying, where a *casa* buys all the tuna caught by a fisher in one go, without grading meat quality. This wholesale system gives fishers as little as PHP50 per kilo, compared to PHP350 or more per kilo for top-quality meat. Straight buying is reinforced by the fact that many fishers are financially and culturally indebted to *casas*, who loan them money for fishing trips and family expenses in exchange for a promise to sell whatever they catch via straight buying.

"Tabaco City in Bicol had five big *casas*. In the past, only one was actually grading fish," recalls Rose. "In 2013, some finally started quality buying by classifying fish as Grade A, Grade B and so forth before purchase. By 2014, all *casas* were doing it. Quality buying made the fishermen realize how much they had been losing because they didn't know how to preserve and market top quality tuna."

She recalls the time when a *casa* said a big tuna was an export reject. Since the fisher finished WWF's training, he contested the decision and the *casa* bought the fish. "Now that fishermen understand how the system works, the *casas* have become afraid of cheating them."

This knowledge can be put to good use for generations. Fishers who know the true value of what they are selling can negotiate for fairer prices – and this means that fishers can indeed earn more, while catching less.

Mid-sized *bangkulis* are carefully placed into shipping boxes for export.

TUNA BYPRODUCTS: WHERE DOES THE REST OF THE TUNA GO?

Though the tuna industry concentrates on tuna loins, rejects or waste parts are sold as specialty products for surprisingly high value. Tuna loins account for just 60% of weight, with useful byproducts accounting for the remaining 40%.

Since the early 2000s, seafood bars and restaurants have started offering tuna bellies, *panga* or jaws, tails, ovaries and eyes as high-priced delicacies. Boiled tuna eyes are delicacies in Japan and taste better than squid. Tuna skin is deep fried as *chicharon* or turned into useful gelatin. Bones and fins are processed for calcium, while gills are turned to animal fodder.

Ever innovative, Pinoys have found a way to market nearly all parts of the yellowfin tuna, so very little of the fish goes to waste.

Grade-A *sashimi* at a restaurant in Batangas. Myoglobin gives tuna meat its distinctive red colour and pliable texture. When it comes to yellowfin tuna, redder meat means higher grade. Rarer bluefin tuna has a slightly different grading process, with fatty pink meat called *ōtoro* and *chūtoro* commanding higher prices.

A Japanese *sushi* chef shows traditional waste products from the *sashimi* industry - a tuna head and tail. In the Philippines, these byproducts have become sought-after delicacies.

Though only the meaty loins or flanks of tuna are turned into *sashimi*, markets have recently been developed to use all other parts, including tuna bellies, jaws, roe and tails.

A COOLER WAY TO STORE TUNA: FORTUNA COOLERS

Seafood degrades rapidly and livelihood potential can quickly be lost from a tuna's journey from the sea to a landing site or market.

The clock ticks as soon as a fish is hauled onboard, for natural processes quickly whittle away its value. As quality declines, the fisher's chances of turning a decent profit plunges. Because of this, many small-scale fishers are forced to sell their catches cheaply, or risk raking in no profit at all.

The challenge is to keep the fish fresh, especially in a tropical country like the Philippines where meat turns rancid in hours. Selling quality fish at good prices is what can keep fishers afloat without having to resort to unsustainable practices like blast fishing. However, the average *bangka* or small-scale fishing boat is too small for a good cooler, and there isn't always a ready supply of ice.

A Philippine-based startup specializing in sustainable cooling devices called Fortuna Cools approached WWF to roll out a catch hold cooler specially designed for fishers. Compact and collapsible, the coolers require little space, with their coconut fiber lining keeping contents cool without the need for ice.

The handy coolers perfectly suited the needs of WWF's fisher partners, fitting inside the cramped hulls and holds of their boats, while freeing fishers from having to buy expensive and fast-melting ice to store fish. Now their catches retained high meat quality and could be sold at far better prices.

WWF eventually secured a grant from the Congressional Spouses Foundation, Inc. (CSFI) to purchase several hundred Fortuna Coolers, which were freely distributed to fishers in the Lagonoy Gulf and Mindoro Strait.

With high-quality tuna leaving the shores of Mindoro and Bicol for high-rolling markets overseas, the business case for sustainably-caught tuna just got a bit cooler.

Small yet innovative technologies introduced between a tuna's journey from hook to cook can buoy the livelihoods of small-scale fishers and is something to constantly watch for. ■

[LEFT] A fisher holds aloft a collapsible Fortuna cooler. Keeping catches fresh has long been a challenge for artisanal handline fishers.

[RIGHT] Through a grant from the Congressional Spouses Foundation, Inc., WWF's fisher partners were able to secure for themselves several hundred collapsible Fortuna coolers.

Equipped with their new coolers, WWF's partner fishers are better equipped to bring high-quality fish to the market.

BOATING RESPONSIBLY:

VESSEL MONITORING MEASURES FOR FISHING BOATS

by Gregg Yan

Our boat fights the fury of Amihan, the northeast monsoon. I'm just fighting to keep my dinner down.

It's night and we're on the *Princess Camile*, a tuna vessel going head-to-head with angry six-foot waves. I gaze out at the darkness. I have no idea where we are – but a little gadget attached to our boat mast does.

To track the routes of fishing boats in the Mindoro Strait, WWF and NAVAMA have outfitted 13 vessels with satellite trackers, the same kind used for commercial cargo.

"These use cellular or satellite networks to plot GPS coordinates and visually depict vessel routes. This is crucial for safety and to ensure that boats fish only in proper zones," explains NAVAMA chief engineer Simon Struck. "The matchbox-sized devices are weatherproof, economical and simple to use."

With local fishers, government leaders and the BFAR, WWF and NAVAMA are promoting fisheries transparency and safety at sea through the *Smart Track Project*.

Fisherman Emelito Macaraig displays one of **13 satellite trackers** installed by NAVAMA and WWF in Mamburao, Occidental Mindoro. The devices use satellite or cellular networks to chart vessel routes, which can be viewed through the SeeOcean Explorer platform on the web.

A Vessel Monitoring Measure (VMM) provided by Futuristic Aviation and Maritime Enterprises (FAME). Portableand affordable, it can help authorities track fishing activities, allowing for better management of Philippine fisheries.

PROMOTING TRANSPARENT, SUSTAINABLE FISHING

Fisheries transparency – where and how fish are caught – is a global issue. Too often are fish gathered through illegal means or in protected areas. Many catches remain unreported.

In December of 2006, the *M/V Hoi Wan*, a Chinese fishing vessel, was caught poaching off the Tubbataha Reefs in Palawan. Amongst its catch were 359 legally-protected Napoleon Wrasse, which can be illegally sold for P6000 per kilogramme.

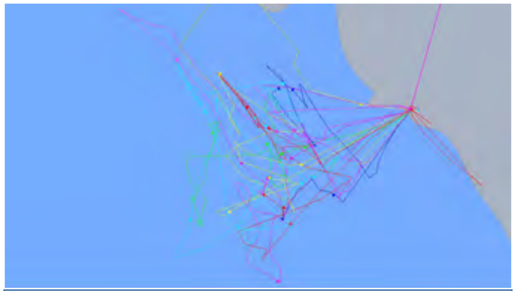
The European Union estimates that about 26 million tonnes of seafood – 15% of global yields – are caught via Illegal, Unreported and Unregulated (IUU) fishing. The Philippines was issued a yellow card in June 2014 for failing to curb IUU fishing. The rating warned the country that unless it addressed IUU fishing, its seafood products would be banned in Europe.

The Philippines acted swiftly by amending its aging Fisheries Code, with Vessel Monitoring Measures (VMM) identified as the best method to ensure that fishing vessels operate only in designated zones. VMM systems rely on either satellite, GSM or radio waves to plot the location and course of vessels.

However, not all systems are affordable. Automated Identification Systems (AIS) for example cost over PHP80,000 and require users to pay a monthly subscription of around PHP10,000 – not too feasible for small or even some medium-scale fishers, who remain among the poorest groups in the country.

Tiny satellite trackers from NAVAMA and radio transponders from the Futuristic Aviation and Maritime Enterprises (FAME) are just some of the many practical and affordable alternatives for fishers to install VMM devices, fully complying with the Amended Fisheries Code mandate to require commercial fishing vessels to install VMM.

Aside from ensuring fisheries transparency and traceability, the devices safeguard boat crews from disasters like piracy and broken engines. Transponders can even relay the needs of a vessel, such as ice or supplies.



Precisely-plotted routes of all 13 vessels with satellite trackers as seen on the SeeOcean Explorer platform. None approached Apo Reef, a protected area southwest of Mamburao.

[TOP] Just a little larger than an average smartphone, the trackers can easily be installed on any fishing vessel.

[RIGHT] All-weather satellite tracker plots coordinates every 15 minutes, 200 meters or each time the vessel alters its course by 30 degrees. It is mounted below a boat's mast and draws power from batteries – though it can be rigged to an engine or a solar-powered system.

PILOT-TESTING THE TRACKERS

Back on the *Princess Camile*, one of our fishers finally gets a bite. He jerks up and furiously pumps a circular handline reel. We watch in silent anticipation and expect what must surely be the largest tuna ever pulled up from Mindoro's depths. Something swims and crashes to the surface ...

He shrugs and shakes his head. "Only a *tuki*. Snake mackerel." Though we didn't score any tuna, we smile as our boat does a 180 turn. Our sea legs will be glad to be on terra firma.

"Fishers aboard satellite-equipped boats can proudly show the world that they only fish in proper zones," shouts WWF technical fisheries officer Dave David above the whistle of the wind.

WWF works with Bicol and Mindoro LGUs, BFAR, WWF International, WWF-Germany, plus European seafood companies and their local suppliers. It has spearheaded the registration and licensing of tuna fishers, vessels and gear to minimize bycatch and illegal fishing.

WWF believes in technology and innovation as conservation aids. "We hope these satellite trackers will become mandatory equipment for all commercial fishing vessels," says Dave. "Just knowing where our fish comes from is a big step in curbing IUU fishing."

* * *

It's nearly midnight when we glimpse the faint lights of Mamburao. Illuminated by moonlight are hundreds of moored fishing boats. Mamburao's fleet is a thousand strong, with a single boat landing 45 yellowfin tuna in just five days. That's a whole lot of fish, which is why WWF is helping locals manage these stocks.

Quietly, we drop anchor and glide to shore. "Wonder where we caught that snake mackerel?" asks Dave. Smiling, I glance at the boat's satellite tracker. "I'm not sure. But we'll know really soon."

CHAMPIONING SUSTAINABLE FISHERIES WITH FISH FORWARD

Globally, the average person eats 19.2 kilogrammes of seafood yearly – almost twice as much as in the 1970s. To satisfy growing demand, larger fishing fleets are pulling thrice as much seafood as what our oceans can annually sustain. Despite the fact that 800 million people across the globe fish for food and livelihood, 90% of the world's fisheries are either overfished or fully fished.

Fish Forward was established to help prevent global fisheries collapse by bridging the gaps between fish, fishers and seafood consumers. It is divided into four parts.

In Europe, Fish Forward talks to the end of the line – seafood consumers, whose purchase decisions drive the dearth or demand for sustainable seafood.

Market-facing campaigns put a face on the types of seafood consumers buy, to help them understand the issues faced by fishing communities as climate change and overfishing continue to take their toll on fish stocks.

Big seafood companies in turn are urged to source stocks sustainably, being massive and influential players in the worlds' fisheries. At the other end of the line are the fisherfolk themselves. For developing nations like the Philippines, Fish Forward talked directly to fishers and fishing communities, extolling the benefits of sustainable fishing practices. When these benefits are understood from hook to cook, the faster sustainable fishing practices can spread.

Lastly, authorities both in Europe and in developing countries are pressed to adopt sustainable fisheries policies. Effective policy-making and enforcement lets sustainability efforts bear fruit.

So what benefits can sustainable fisheries offer?

Fish Forward focused on the following: the role and importance of fishers, especially in developing nations, gender equity and the opportunity for womens' meaningful participation in fisheries, climate action and conservation, plus how sustainable fishing means more tuna for generations to come.

Since 2017, Fish Forward has been working closely with Filipino fishers through workshops, helping them further appreciate the benefits sustainable practices can bring to their communities.

A gender workshop helped women realize varied roles as active participants in their respective coastal communities. Fish Forward allowed WWF to branch out to other seafood commodities, like blue swimming crab fisheries in Negros, while climate change workshops contextualized the many environmental changes fishers have been experiencing over the past decades.

Yellowfin tuna on sale at a wet market. From hook to cook, fisher to consumer, in the fisheries of the Philippines to the plates of diners as far away as Europe, the conservation of the worlds' fisheries requires the support and commitment of all.

Fish Forward was an excellent opportunity for WWF to explore how climate change affected the lives of Filipino fishers. A commissioned study examined climate effects, while a video was produced for European seafood consumers to better understand climate effects on fishing communities.

Through the years, fishers eventually became spokespersons for sustainable seafood. Using their learnings from Fish Forward, fishers have lobbied with their FARMCs and even at national forums for the rights of small-scale fishers while furthering the long-term sustainability of their own livelihoods.

From hook to cook, the push to protect the worlds' fisheries must be inclusive and comprehensive. Fishers and consumers both have critical roles to play in safeguarding our oceans. Fish Forward aimed to help the sea's stakeholders realize that in their world, forward thinking means sustainable fishing.

As the effects of climate change and human exploitation take their toll on the worlds' fisheries, it has become important to identify the various stakeholders of the fisheries industry, while understanding the roles they play.

A MINDSET OF MODERATION: FISHERIES IMPROVEMENT PROJECTS

To prevent the kind of overfishing which already decimated 10 of the country's 13 fisheries, WWF worked ceaselessly to convince fishers that catching just a few high-quality tuna and selling them at premium prices was a better idea than just catching more and more fish. But what's to stop enterprising fishers from catching as much tuna as they can and selling them at premium prices anyway?

This conundrum faced WWF's Sustainable Tuna team in 2013. The team had been working with tuna fishers in the Lagonoy Gulf and Mindoro Strait since 2011, after European supermarkets approached them with a desire to sell sustainably-sourced fish. They had been importing their fish from the two areas for a long time, but market changes in favor of sustainably-sourced products led them to act accordingly.

The goal? A Fisheries Improvement Project (FIP) to ensure tuna fisheries were sustainable, coupled with a certification from the Marine Stewardship Council (MSC) to let fishers sell their fish at better prices. European retailers could then assure their customers that the food on their plates were ethically sourced.

FIPs are multi-stakeholder efforts which aim to solve the numerous environmental challenges facing fisheries. FIPs use the power of fishers, processors, retailers and other private sector players to incentivize sustainable practices through long-term policies.

A fisher carries a yellowfin tuna to shore. WWF has been championing Fishery Improvement Projects in fisheries across the globe. In 2013 an FIP was launched in the Lagonoy Gulf and Mindoro Strait, to help tuna fishers on their journey toward sustainable fisheries.

A couple dries fish along the shores of Mindoro. Fish drying extends the shelf life of fish while adding value to seafood. Women play an important role in post-harvest activities.

Each FIP is tailor-fit for each fishery and starts with a pre-assessment – an on-the-ground study conducted for the fishery to understand the gaps keeping stakeholders from achieving qualified sustainability. FIP plans can then be developed and rolled out by stakeholders.

Assessments were conducted in the Lagonoy Gulf and Mindoro Strait. Fishers and their families were interviewed to bring light to their concerns.

Gaps were identified. There was for instance, no legal basis for enforcing sustainability and no management plan on either the local or national level designed to protect tuna stocks. With few policies in place to prevent Illegal, Unreported and Unregulated (IUU) fishing or to protect endangered species, tuna fisheries were left largely unchecked. All these needed addressing for the fisheries to be considered sustainable.

Local and national management plans were soon passed to create an enabling environment for sustainable fisheries, while technology was pursued to help enforce it. Sensible catch limits were observed and organizations were formed on many levels, from TFAs to IFARMCs. The Philippine Tuna Handline Partnership (PTHP) was created as a sign of a commitment to sustainability across the whole supply chain. Finally, social enterprise and diversified livelihoods were added to ensure the FIP maximizes benefits for stakeholders.

And to answer the question of why fishers shouldn't catch and sell all that they can in one go, WWF reminded them that fisheries are just like ATM machines – users simply can't keep withdrawing without depositing something in return.

The past decade has been an ongoing journey to introduce both sustainability and equity across the tuna supply chains of the Philippines. Constantly evolving, WWF's tuna FIP has remained true to its most defining characteristic – that it is rooted in the well-being of the ocean and the fishers who depend the most on it. ■

FEATURE STORY

Fisherman Edgardo de Vera sails into the calm waters of Lagonoy Gulf under the cover of night. The night fishers of the Philippines spend whole nights out at sea in pursuit of a good catch.

A TOUGH TRADE: BICOL'S NIGHT FISHERS

by Alo Lantin

Night falls above the Lagonoy Gulf. Countless stars mirror the many white lights aboard little wooden fishing boats that have set sail in the dead of night. Stalwart against the cold and the dark, they brave the dark hours with the hope, perhaps, that tonight will be the night they get to bring home tuna to support their families.

As darkness falls, Bicol's night fishermen take to the sea.

The Lagonoy Gulf in Bicol is a tuna-rich stretch of water connected to the Pacific off the eastern seaboard of the Philippines. Ringing it are the prosperous cities of Legazpi, Tabaco and Virac, while many small fishing villages dot its expansive coastline. Here, gulf waters spill into the high seas and crashing waves of the Pacific Ocean.

Onshore sit Joel Bongkingki and Edgardo de Vera, perched atop the boughs of a fishing boat no wider than two feet. The two are good friends and have worked the fisheries of the Lagonoy Gulf since childhood. Outspoken and intelligent, they are both active members of their local tuna federation. As WWF's partners in conservation, they support the livelihoods of their fellow small-scale tuna fishers, pushing policies at town halls and lobbying passionately at nationwide conferences.

But on most nights they ply the waters of the Lagonoy Gulf as night fishers.

Joel loads fish chum into the boat as he prepares to set sail. "It's good to wear a jacket if you're going to fish at night," he murmurs wrapped tight in his sweater, his head snug beneath a baseball cap. "It's freezing."

Eight in the evening. The last light of day has long gone. All is black under the new moon save for a bubble of white light that shines around the boat. Edgardo and Joel have trained a bright lamp against the dark waves to simulate the moon, hoping to draw out tuna. Two hours of sailing straight into the night have led them to the center of the Gulf.

The two fishers set about the boat, baiting lines and hanging them off the sides. They catch squid on a separate hand line, which they use to lure tuna from out of the depths.

Fisher Boy Bongkingki holds up a solar-powered lamp. Dwindling stocks and the effects of climate change have forced fishers into harsher and harsher conditions, with some braving the crashing waves of the Pacific.

"When it's off-season, you're up against luck. When it's tuna season, what you're up against is the weather," explains Joel. Tuna season in Eastern Bicol starts around August, at the height of the monsoon season. The seas are at their roughest at this time, and fishermen are often left stuck on shore, unable to set sail. Other times they take their chances with the weather, risking their lives against a churning ocean.

"Tuna don't like the heat. When it's hot, they'll go far away – so by day, they prefer to stay deep," explains Edgardo.

With their lights on the lookout and their handlines baited and ready, the two lean against the boughs of the boat, their eyes never straying from the still sea that surrounds them. They sit, their hands ready like triggers on their hooks and nets, waiting to snag their first tuna. Then they wait.

And wait.

Together, they wait all night.

Hard effort and long hours bring no assurance that the night fishers will bring home a catch. A host of anthropogenic pressures have pushed many fisheries to the brink of collapse. Destructive illegal practices and overfishing have decimated global tuna populations, while warming seas have pushed tuna further out, following the cold waters where they thrive.

As the tuna suffer, so too do the fishers who rely on them.

"Even the squid seem to be running out. See, these are all so small," says Edgardo, holding up a squid no longer than his finger. Early morning draws near without so much as a sighting of a tuna. The fishers settle in for a nap, draped over the sides of the boat.

Stories abound of long-gone years when the Gulf's fisheries were still healthy and when tuna could be found aplenty. In the early morning you could set your rice to boil, explains Joel, before walking out to the shoreline with a spear in hand. You could snag a tuna just like that, then make it back home just in time for your rice to finish cooking. Such abundance was prevalent all along the shoreline surrounding the Lagonoy Gulf.

But those days are long past. Now, whole nights can pass without a single tuna sighting. Weeks can go by with fishers having nothing to take to the market.

"We grew up doing this. It isn't easy to just change livelihoods," laments Edgardo, holding a squid up to one of the lamps to examine it. He hooks it back on a line and tosses it back to the sea. "You know, if there were a way to earn more from this work, then why not?"

For people like Edgardo and Joel, leaving the fisheries of Lagonoy isn't an option. Trained as fishers from an early age and with scant opportunities open to them, they have little choice but to stay with the livelihood they know. As tuna stocks falter, they've had to find new ways to augment their income, or risk sliding into poverty.

"I manage a rice field when the fishing isn't good. You have to have other ways to make money in this industry," explains Joel. During off seasons, many fishers manage small plots of farmland, though the seasonality of crops and their split attention between the fields and the sea spells a precarious livelihood situation for them to sustain their families off of. Some run side jobs working in construction, or ferry passengers aboard tricycles. The enterprising ones, gifted with capital, explore ways to further process the tuna they catch to make the most out of each fish they land, though even that depends on whether or not they can land fish in the first place.

Deprived of income, fishers find themselves more vulnerable to shocks than ever before. The shores of Lagonoy are also the landing site for many of the countries' storms. The loss of fishing boats and homes can bring ruin to people already struggling to stay afloat, which is why WWF works double time to help manage tuna stocks in this part of the world.

Driven by desperation, some fishers dare to face the open Pacific to find richer tuna stocks, braving the odds to provide for their families. "This is risky work, you know," shares Edgardo, as he tells stories of fishers lost to the open ocean, never to be seen again. "There are many widows of high seas fishermen back in town."

* * *

"No catch tonight," says Joel, reeling in the hand line as the first rays of morning turn the sky from deep blue to pink. In the hold lie some pink squid, a silvery freckled snake mackerel – and no tuna. Not so much as a glimpse of one. "This is the fourth night in a row without a catch."

The tuna-rich waters of Lagonoy have brought life to many fishers who have lived on its shores and plied its cool waters for decades. Thousands continue to do so – but with tuna stocks dwindling and fisheries teetering on the edge of collapse, many now struggle to earn for their families. Still, many soldier on and sail out to sea deep through the dead of night – because they have no choice, and because they truly believe a better tomorrow is still possible.

Joel holds up the small snake mackerel, the only catch of note for 13 hours at sea. "At least we caught this one. Perhaps we'll have better luck tomorrow."

Edgardo de Vera reels in a squid, caught on his handline. Almost all of his catches that night were squid. Despite their best efforts, fishers often return from a night out at sea with nothing to take to the market.

CO-WRITTEN WITH CARE: NATIONAL AND LOCAL TUNA MANAGEMENT PLANS

Sustainability must be rooted in development plans and legal frameworks to truly safeguard fisheries over the long term. Even if small scale fishers organize themselves, sustainable fisheries simply cannot thrive without the proper policy environment.

To complement and reinforce development work being done at the community level, WWF engaged the national government to develop a National Tuna Management Plan (NTMP).

Crafting a management plan, especially one that affects the livelihood of thousands of people, must be a science-based and participative process. Plans should protect vital livelihoods without sacrificing the environment, so WWF and its partners sat down with tuna fishers and stakeholders across Bicol and Mindoro to draft plans which realistically reflected the needs of the sector.

The Bureau of Fisheries and Aquatic Resources (BFAR) passed the NTMP in 2018, after much lobbying from WWF, concerned organizations and fisherfolk. The next step was to translate these plans down to the local level – across regions and provinces, down to the very communities most involved in tuna fishing.

The process of passing local management plans is similar to the work that went into creating the NTMP. Sitting down once again with local fishers, WWF set about drafting tuna management plans for each of the local governments it works with. Once ready, the plans were endorsed to the Municipal Fisheries and Aquatic Resources Management Council (MFARMC), which then elevated them through the municipal government and the Mayor, where final authority rests.

These plans are checked and re-checked alongside the NTMP to ensure they closely match national goals. The goal is to craft localized tuna management plans that are in-line with the goals of the government, written to meet the actual needs and respective contexts of fishers on the ground.

In 2019, the Mindoro Strait Tuna Management Plan was passed, after three years of close work between fishers and the provincial and national government. A similar plan for the Lagonoy Gulf is in the works. Thus far, three of the 21 LGUs WWF works with have adopted their own management plans, with work underway to have one ready for each municipality.

The process of preparing national and local tuna management plans is long and arduous. However, it is a crucial step to ensure that the sustainability of our fisheries is co-written with care.

The new community fish landing center of Malilipot, Albay, along the shores of Lagonoy Gulf. Each local tuna management plan outlines steps and measures to be taken to help develop a specific fishery.

A fisher stands proud with buckets of freshly-caught *pundahan* or skijpack tuna. Good management plans co-written with the fishers themselves is an important step in the journey towards sustainable fisheries.

A fisher shows off his handline reels. Their presence during the writing process of each management plan helped ensure that their needs were reflected in how their fisheries are managed.

POLICIES FOR FISHERS, BY FISHERS: IFARMC

Empowering small-scale fishers is important, but not complete without good management.

To reach MSC certification and to ensure the long-term survival of the marine resources in the Lagonoy Gulf and Mindoro Strait, fishers should directly help in managing their own fisheries.

Fisheries and Aquatic Resources Management Councils (FARMCs) were first established in 1998 with the passing of the Fisheries Code of the Philippines. FARMCs allowed the government to decentralize the management of the country's fisheries. By devolving fishery management down to the local level, BFAR could more efficiently oversee the country's marine resources.

This was a multi-level system, with the national FARMC serving as the main governing body for smaller councils to align their policies with. Municipal and city FARMCs oversaw fisheries on a local level, while integrated FARMCs would oversee bays, straits and gulfs, bringing together MFARMCs and CFARMCs to manage shared fisheries resources.

FARMCs were to be multi-stakeholder bodies. Each council was to be composed of representatives from the government, the academe, the public and private sectors and the fisherfolk themselves, to represent a broad range of interests.

As one council, they would decide on practices and policies tailor-fit to the needs of their fisheries, for they knew their locality best. Everything from law enforcement to livelihood development, zoning, pollution control and conservation would be overseen by the FARMCs and the policies they developed.

WWF saw an opportunity to develop the FARMC system. In looking for ways to improve the management of the fisheries they were working with, WWF learned of a previous attempt to establish an IFARMC for the Lagonoy Gulf. Started in 2002, the IFARMC failed because there weren't enough people to make it work well. In 2014, WWF took the chance to start the process all over again.

An agreement with BFAR led to WWF being put in charge of organizing the Lagonoy Gulf's IFARMC. WWF had the manpower and maintained close enough relationships to the fishing communities of Lagonoy to organize and bring them together. With the blessing of BFAR and the intent to ensure the long-term survivability of tuna stocks across the country, WWF got to work.

To organize an IFARMC, you first need MFARMCs and CFARMCs. To organize these, you need registered organizations to participate in them. This was where the Tuna Fishers' Associations (TFAs) came in. As peoples' organizations recognized under the Philippine government, they could sit on FARMCs as representatives of small-scale fisherfolk.

The Lagonoy Gulf's IFARMC began to take shape. So did one for the Mindoro Strait. To officialize and streamline their work, BFAR recognized WWF's staff as FARMC facilitators. They had the authority to organize and build the capacities of these FARMCs and to assess and grade them on their performance.

As they worked to put together the IFARMCs, WWF took the chance to impart lessons of sustainability with the fishers they were meeting with. The goal of improved management, after all, was to secure the viability of these fisheries well into the future. As members of councils overseeing their own marine resources, the fishers were in the perfect position to ingrain sustainability principles into the management of their fisheries.

The IFARMCs of the Lagonoy Gulf and Mindoro Strait have since become models of Philippine fisheries management. BFAR, using a ranking system they developed to determine the effectiveness of each FARMC, consistently assigns Level Five excellency to both these IFARMCs – top marks and an affirmation of how capable they have become.

Each IFARMC has also given small-scale fishers an incredible degree of influence over fisheries across the country, the likes of which they had never seen before. Arnel Boholst, a fisher and chairperson of the IFARMC of the Lagonoy Gulf, sits on a committee that manages fisheries across the entire Eastern seaboard of Luzon – a range far greater than most fisherfolk would have access to.

The IFARMCs were a way for WWF to improve tuna fisheries management in the Lagonoy Gulf and Mindoro Strait. They brought together and harmonized disparate towns and cities to protect their shared resources.

It also let small-scale fishers take the reins in managing their own fisheries. As their influence grows, so too does the hope for sustainable fisheries across the country. ■

Atenogenes Reaso, handline tuna fisher and Chairperson of the Gulf of Lagonoy Tuna Fishers Federation, Inc., takes the stage at the *All About Handline Summit 2019* in General Santos City to share the progress he and his fishers have made in managing their own tuna fishery.

A TRIUMPH OF GRASSROOTS ORGANIZATION: TUNA FISHERS ASSOCIATIONS

When work began in the Lagonoy Gulf and Mindoro Strait in 2011, local perceptions toward NGOs weren't exactly too good. Many organizations had come and gone with no lasting initiatives. Projects were conducted but dropped, never to be sustained in the long run. The communities themselves were demoralized after years of what they felt was pointless, wasted effort.

This for WWF represented more than just a barrier for entry into these communities. Given the history of the area, the drive to push sustainable fisheries simply couldn't come from WWF, but the fishers themselves.

An opportunity to organize communities came in 2000, with the passing of Fisheries Administrative Order No. 196. FAO 196 called for the establishment of Fisheries and Aquatic Resources Management Councils (FARMCs) to decentralize the management of fisheries. FARMCs were to be small enough to encompass the boundaries of single towns or municipalities. Each could only be populated with members of state-recognized peoples' organizations. In Lagonoy and Mindoro, such groups were in short supply.

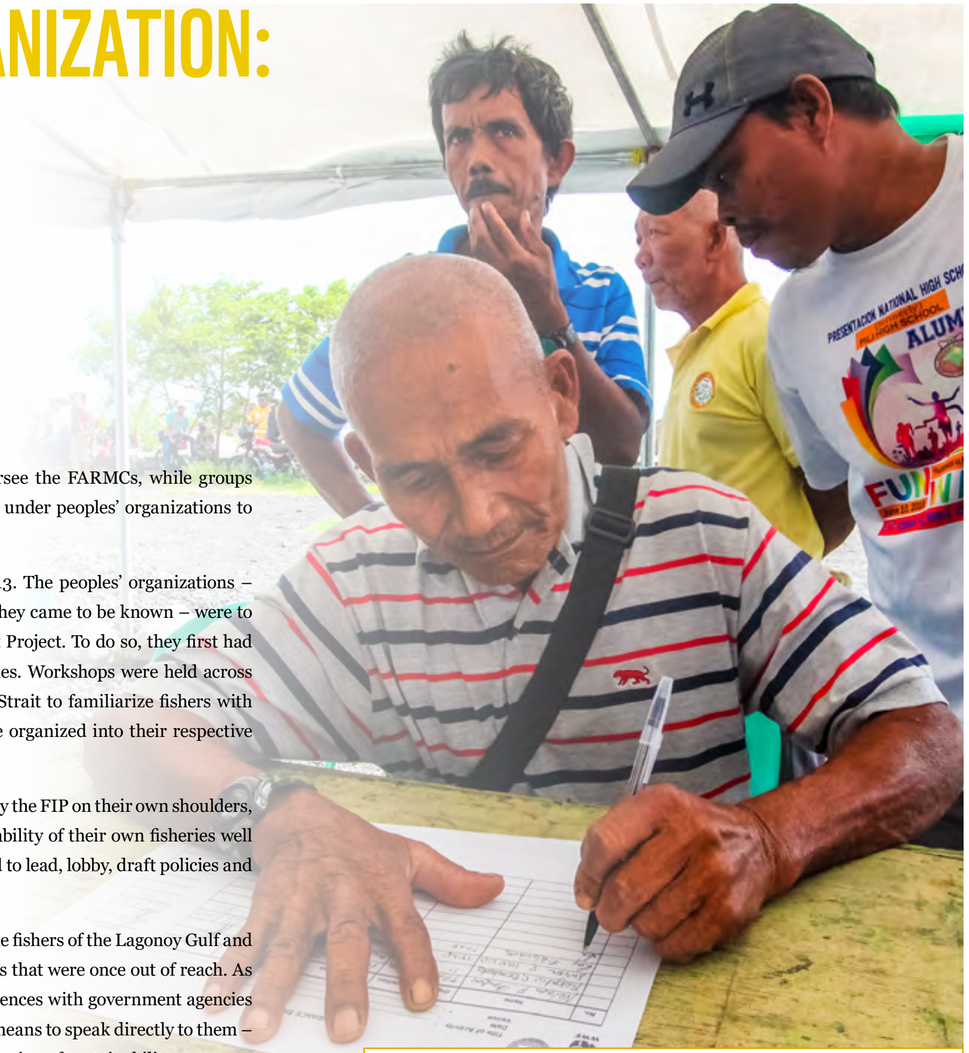
Recognizing an opportunity for handline fishers to organize themselves, WWF extended a hand to the Bureau of Fisheries and Aquatic Resources.

The agreement was for BFAR to oversee the FARMCs, while groups like WWF would help fishers register under peoples' organizations to populate the councils.

Social preparation work began in 2013. The peoples' organizations – Tuna Fishers Associations (TFAs) as they came to be known – were to spearhead the Fisheries Improvement Project. To do so, they first had to be drilled in sustainability principles. Workshops were held across both the Lagonoy Gulf and Mindoro Strait to familiarize fishers with sustainable fishing, even as they were organized into their respective TFAs.

The goal was for them to be able to carry the FIP on their own shoulders, so that they could ensure the sustainability of their own fisheries well after WWF had left. They were trained to lead, lobby, draft policies and speak in front of large audiences.

Through their newly-founded TFAs, the fishers of the Lagonoy Gulf and Mindoro Strait had access to platforms that were once out of reach. As individuals, they struggled to get audiences with government agencies and policy makers. Now they had the means to speak directly to them – lobbying for their rights and for the passing of sustainability measures with gravitas and the support of the TFAs.



Fishers sign an attendance sheet. Over the past decade, thousands of handline fishers in both the Lagonoy Gulf and Mindoro Strait have banded together in Tuna Fishers Associations to lobby for their rights and to uplift their livelihoods.

Sustainable tuna team member David David shares a presentation with fishers from the Gulf of Lagonoy Tuna Fishers Federation, Inc. Each TFA is an opportunity for fishers to fight for the improvement of their fisheries.

By 2015, WWF had helped bring together 140 tuna fishing villages into 21 TFAs, representative of over 6000 small-scale fishers. These were organized even further – across regions, into official federations that crossed geopolitical borders and encompassed whole fisheries.

The fishers of Bicol now have the Gulf of Lagonoy Tuna Fishers Federation, Inc. (GLTFFI), while those in Mindoro had the Occidental Mindoro Federation of Tuna Fishers Associations (OMFTFA).

The handline tuna fishers of Bicol and Mindoro have come a long way. Their federations meet regularly with the BFAR and are regular speakers at the National Tuna Congress held each year in General Santos. In 2019 the Congressional Spouses Foundation, Inc. donated PHP2 million to the GLTFFI and OMFTFA to develop their coastal communities the way they saw fit.

The FIPs championed by WWF are deeply entrenched in the lives of the fishing communities most dependent on them. Where other FIPs have been industry or government-led, the FIPs of the Lagonoy Gulf and Mindoro Strait have been a triumph of grassroots organization, with small-scale fishers coming together to decide on what's best for their communities and coasts. The fishers themselves are at the helm, capable of sailing into sustainable waters, well into the future.

FINANCIAL RESILIENCY FOR FISHERS:
GROUP SAVINGS AND LOANS COMMITTEES

For as long as anyone can remember, the tuna fishers of the Lagonoy Gulf and Mindoro Strait have struggled with debt. It's just a fact of life.

The fisheries supply chain is designed so that fishers can borrow money from powerful *casas* or consolidators when the chips are down.

Theoretically fishers can pay their debts as soon as they land another boatful of fish – all well and good in a world without overfishing and stronger climate change impacts.

In reality, fishing is far more volatile than farming, being dependent on healthy fish stocks, the weather – and luck. Fishers can quickly dry up their savings when a storm prevents them from fishing, or when they bring in less fish than what they needed to offset the fuel, supplies and wages they just spent.

Aside from the daily cost of food, many fishers engage in vices like drinking or gambling. During peak season when lucky boats return full of bounty, some fishers act like 'one-day millionaires', blowing all their earnings on a few days of merriment, before returning to the nearest *casa* to borrow more money. Again, another fact of life.

A major sickness, the birth of a new child or any big life change can also force a fisher to borrow a huge amount of cash, plunging him into a cycle of debt which can take years – even decades – to pay off. The relationship between fishers and *casas* is also cultural, with utang na loob or gratitude dictating that fishers sell their catches via straight buying to the *casa* they loaned money from – usually at lower prices.

To provide local fishers with a much-needed financial buffer, WWF introduced Group Savings and Loan Committees (GSLC), a widely-used model of community organizing practiced across the globe. GSLCs were designed for agrarian communities to prepare for lean seasons brought about by low crop yields and disasters. It also allows them to negotiate for fairer prices, as people desperate to feed their families are more prone to selling their produce at any price.

In 2019, WWF hopped from community to community to help them establish their own GSLCs, organized as part of the various community-led Tuna Fishers' Associations (TFAs). The process was democratic. Fishers gathered for a multi-day seminar on financial literacy, where they learned the importance of saving as a collective entity and not merely as individuals.

Towards the tail end of each seminar came the founding of the GSLC proper. A board was elected, bylines were drawn and everyone was made to vote on a group savings system that worked for them. Both fishers and their wives were key components of the GSLCs, for though men were usually household heads, their wives often handled their finances.

The GSLCs introduced by WWF allow fishers to take better care of their families by giving them a financial safety net. Funds borrowed from the GSLCs remain in the community instead of being channeled out of it.

The idea is simple – at set intervals, each member of the GSLC must drop a small service fee into the communal pot to reassert their membership. Whenever a member is in financial need, the community can vote on how much support to lend them. There was no longer a need to loan from local *casas* or banks.

All funds were raised by the community and would stay there to be used for their needs. The possibilities were limitless: gasoline, boat repairs, fishing equipment, meeting halls, port improvements, a processing plant – whatever the community believed they needed.

When COVID-19 came in 2020, the communities put their GSLCs to the test. Crushed first under the weight of the global pandemic, the communities were also battered by a series of vicious storms. With their supply chains strained and with much to repair and rebuild, they needed a buffer to help them get back on their feet.

Luckily they had just established their GSLCs.

The money pooled under their GSLCs meant they were never too far from financial aid. There proved to be enough cash to go around, with some groups having saved up in excess of a hundred thousand Pesos. Social fund pools meant families could dip into the pot to support themselves when the need was most dire. Propped up by the communal security lent to them by their fellow GSLC members, more people joined to pool their funds and earnings.

The GSLC system was so successful that neighboring communities and groups all along the supply chain took a page from the tuna fishers and began putting up their own committees.

Independence and resiliency were the promises of the GSLC model introduced by WWF. Today, fishers from the Lagonoy Gulf and Mindoro Strait have a buffer against the next personal or provincial disaster – allowing them the peace of mind to meaningfully participate in sustainable fisheries.■

Money borrowed by GSLC members can also be used to jumpstart other businesses, like this mobile seafood stand. Financial literacy extends beyond escaping from debt. It's a mindset for growing wealth.

THE ROAD TO SUSTAINABILITY:

HOW LOCAL FISHERS SECURED THE FIRST MSC CERTIFIED FISHERY IN THE PHILIPPINES

Sure, the fish on your plate looks delightful, but how do you know if it was caught sustainably?

Seafood certification is a complicated topic, with over 50 global certification schemes covering all aspects of the supply chain. But one ecolabel has been recognized over the years as a good stepping stone towards sustainable fisheries - MSC.

The Marine Stewardship Council (MSC) independently certifies fisheries which have complied with the MSC fisheries standard, a set of rules designed to help manage the stocks and ecosystems of fisheries, improving the way they are governed. Since it was established in 1996, over 400 or 15% of the world's fisheries have been certified by MSC, making it the most popular certification standard for wild fisheries.

Certified products are tacked with MSC's iconic blue tuna logo, to signify that they've met the ecolabel's stringent standards.

A 50-kilogramme yellowfin tuna is gently washed before export. By recognizing and rewarding sustainable fishing practices, ecolabels like MSC are influencing the way people catch, choose and eat their seafood.

THE ROAD TO MSC CERTIFICATION

Tuna are among the world's most sought-after fish, so it's no surprise that half the world's tuna fisheries are now engaged in the MSC's certification programme. MSC promotes practices to ensure that tuna stocks are healthy and well-managed, while reducing bycatch impacts on species like marine turtles, dolphins and seabirds.

However, the tuna industry is still dominated by commercial purse seiners and longliners, with the high costs and capital requirements of MSC evaluation preventing most small-scale fishers from applying for MSC certification.

Compared with commercial scale fishing which targets entire schools of fish, small-scale or artisanal handline fishing is less harmful to the environment because fishers use highly selective fishing gear. Reels rigged with a single large hook ensure that only adult fish are caught, with juveniles left to swim and spawn.

Tuna trader Sam Garcia and fisher leaders Atenogenes Reaso and Johnson Peralta sign the Philippine Tuna Handline Partnership (PTHP) into existence. The PTHP is the client group unto which MSC certification was awarded, making them the first group of small-scale fishers in Philippine history to earn the ecolabel.

Since 2011, WWF has been helping yellowfin tuna fishers in the Lagonoy Gulf and Mindoro Strait to secure the country's first MSC ecolabel. Generations of these fishers have been using simple handline reels to pluck out large tuna

After a decade of work, the Philippine Tuna Handline Partnership (PTHP), an organization of tuna fishers and processors backed by WWF, finally succeeded in securing the coveted ecolabel in 2021. PTHP works specifically with small-scale yellowfin tuna fishers in the Philippines and covers nearly 500 tuna handline vessels plying the Lagonoy Gulf and Mindoro Strait.

The certification was the result of an effective multi-stakeholder partnership between the public and private sectors, plus civil society players, both local and international. Various stakeholders, from global regulatory bodies to local government officers, worked in unison to educate and empower small-scale Pinoy fishers.

Though spearheaded by WWF-Philippines together with WWF national offices in Germany, Switzerland, the Netherlands and United Kingdom, the project was heavily supported by New England Seafood, Inc., Waitrose Ltd., Sainsbury's, Marks and Spencer, Bell Seafood, Swiss Coop and Seafresh. Public sector bodies such as the Development Bank of Germany (DEG), the Federal Ministry for Economic Cooperation and Development (BMZ), the Bureau of Fisheries and Aquatic Resources (BFAR) and LGUs in the Lagonoy Gulf and Mindoro Strait readily supported the programme.

"We're glad to have helped facilitate the country's very first small-scale MSC certification," beams WWF's Joann Binondo. "We're incredibly proud of our artisanal fishers, who have shown the world that even the smallest players can supply world-class seafood."

The tiny blue label opens up markets for the yellowfin tuna sourced from the two sites, as global seafood importers prefer certified MSC products. ■

WAITING FOR TUNA:
HOW TUNA FEDERATIONS CAN BRING BACK THE BIG FISH

by Gregg Yan

Late afternoon and we're holed up in a hut along the coast of Tiwi in Albay, trading fish tales and waiting for fishermen to return. Sitting around us are their wives, mending nets and eyeing the swelling crowd of kids cajoling in the surf. This time of year, highly-prized *bangkulis* or yellowfin tuna pass through Albay by the thousands.

The first of the outrigger bancas arrive, unloading a decent haul of *pundahan* or skipjack – small, striped tuna which have proven surprisingly resilient to commercial fishing. Bancas two and three return empty-handed while a fourth disgorges a tub of *galunggong* or scad. Few yellowfin tuna are landed.

"The Lagonoy Gulf is the Bicol region's richest tuna site – but it is heavily overfished," explains BFAR National Stock Assessment Project Head Virginia Olaño. "Two decades ago, fishers regularly caught large yellowfin. In 1998, a fisherman landed a 196 kilogramme giant, long as a car and fat as a drum. Now yields are waning and yellowfin average just 18 to 35 kilogrammes – meaning adult catches have been replaced by juveniles."

Though yellowfin tuna are economically-valuable, they're far more than just seafood. Top predators in the marine food chain, they maintain the balance between oceanic predators and prey. "Today the Lagonoy Gulf's most common fish are anchovies," warns Olaño. "There aren't enough predators to eat them – because we've eaten most of the area's hunters."

Fisherman hauling a 40-kilogramme yellowfin tuna in Albay. The giant fish are processed and exported to a host of international destinations.

Gulf-wide Meeting of Tuna Fishers

To stop overfishing and help manage existing tuna stocks in Bicol, WWF, BFAR and the Philippine Council for Agriculture and Fisheries (PCAF) convened the first meeting of the Gulf of Lagonoy Tuna Fishers Federation (GLTFF), comprised of the coastal municipalities ringing the Lagonoy Gulf – 3070-square kilometres of sea separating the Bicol mainland from the storm-swept island of Catanduanes. Over 500 people attended Bicol's first large-scale gathering of fishers, held at the Lagman Auditorium of Bicol University's Tabaco Campus in June of 2015.

"We've waited three years to formalize this federation, which covers 2000 tuna fishers in the Lagonoy Gulf," says Marjurie Grutas, BFAR Assistant Regional Director in 2015. "GLTFF aims to synergize fisheries management while optimizing cooperation, knowledge-sharing and enforcement. We aim to eliminate illegal fishing, minimize the capture of juvenile tuna and drive commercial fishers away from municipal waters – the three leading causes of overfishing."

Since 2011, WWF has been working to enhance yellowfin tuna management practices for 6000 fishers across 21 municipalities in the provinces of Occidental Mindoro, Albay, Camarines Sur and Catanduanes.

Bangkulis or yellowfin tuna (*Thunnus albacares*) are the most highly-prized fish in Bicol's Lagonoy Gulf. A fisher shows off a 40-kilogramme fish. A decade ago, golden-finned *bangkulis* were much larger.

WWF's Public Private Partnership Programme Towards Sustainable Tuna (PPTST) has since organized tuna fishing associations in all 15 municipalities in the Lagonoy Gulf, plus six LGUs in the Mindoro Strait. It spearheaded the registration and licensing of tuna fishers, vessels and gear to minimize bycatch and illegal fishing, deployed 1000 plastic tuna tags to make the fishery traceable, and completed a series of training sessions on proper tuna handling to ensure that exported tuna continually meet international quality standards.

PPTST harnesses market power and consumer demand to promote sustainably-caught tuna and support low-impact fishing methods like artisanal fishing with hand-line reels – better alternatives to commercial tuna long-lines, which stretch up to 80 kilometres and are rigged with up to 3000 baited hooks.

Funded by Coop, Bell Seafood, Seafresh and the German Investment and Development Corporation, PPTST involves European seafood companies plus their local suppliers, BFAR, local government units in the Bicol Region and Mindoro, the WWF Coral Triangle Programme, WWF-Germany plus WWF-Philippines.

Today about 52% of the country's fish exports come from tuna, which buoys the lives and livelihoods of millions of Filipinos.

"By working to conserve their shared resource, Lagonoy Gulf's fishers might someday herald the return of the big fish," says WWF's Joann Binondo. Now that fish tale should be worth the wait.

THE PROJECT TEAM

Tambuyog's work in the tuna industry aims to promote a social and environmental reform agenda which puts stress on the rights of handline tuna fishers, the management of tuna stocks and the wider coastal environment. Our collaboration with WWF in implementing its sustainable tuna initiatives provided us with the opportunity to work with the supply chain actors to develop inclusive value chains that yield tangible returns and benefits for partner tuna handliners. Through the project's support, we managed to gain more technical and practical inputs to better deliver these outputs with the active participation of our partner tuna handline organizations.

Dinna Umengan
Tambuyog Executive Director

I am very grateful for over a decade of working together with the extremely dedicated WWF Philippines team and for continued donor support. It is very moving for me to witness the project's achievements. As the path towards full sustainability and equity for fisher families is a long one, we will surely continue treading on our journey.

Catherine Zucco
WWF-Germany Project Coordinator

My hope is that our partner fishers will be able to improve their resilience in the face of the emerging challenges of globalization, economic development, social transition and climate change. I hope that they will be able to employ sustainable fishing practices that lead to healthier fisheries. To do so would mean more tuna in our seas, and more income opportunities for our fishing communities.

Florenda Lazaro
WWF Finance Manager

My journey with WWF's sustainable tuna project helped me appreciate the efforts of our fishers. Hearing their stories, seeing how their fisheries have improved over the years through the work we've been doing with them, hearing what they have achieved through themselves – all this helped me understand the importance of bringing communities together in the name of sustainability.

Honey Grace Añonuevo
WWF Community Development Officer

There's a right time for everything. Like how our project was able to stand strong against stormy weather for over a decade, it's important for us to bring something to our stakeholders as they take their first steps toward sustainability. This was not about pushing them along as mandated, but encouraging them through a journey of discovery, towards better things and better lives, for themselves and the waters they rely on.

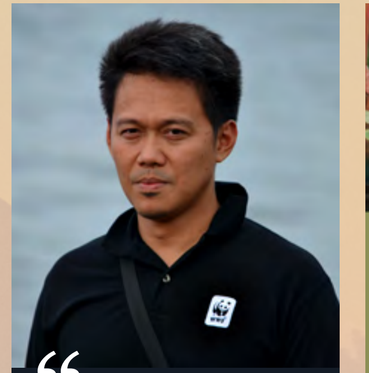
Leah Villanueva
WWF Fisheries Management Specialist

Our fight for sustainable fisheries is challenging, but everyone involved is courageous and commitment in cooperating toward victory. There's nothing that brings me greater happiness than seeing our fishers find their voice in protecting our precious oceans.

Cha Belgra
WWF Bookkeeper

Working with WWF's sustainable tuna team has been an exercise in gratitude – gratitude for the team, for our partners, for our fisherfolk, and for the bounty of the ocean that sustains so much life. I hope our partner fishers and their communities continue to stand strong against the rising currents of climate change, overfishing and unethical practices that threaten their lives and livelihood. Together with them, we can make a real difference.

Raisa Pandan
WWF Project Officer



The journey towards sustainable fisheries is hard and a bit complicated. Challenges and frustrations are inevitable, but if you see effort and determination among key players, hesitation shall be replaced by hope. Transparency is the key to achieving sustainable fisheries, maintaining healthy oceans, plus equitable livelihoods for our fishers and coastal communities.

David David
WWF Fisheries Technical Officer

This work has not just been about salaries, livelihoods, professions or what have you. It has been about the depth of commitment of our team and of the fishers we've been working with towards making a difference – both in the lives of people and the wellbeing of our fisheries.

Marietta Calacal
WWF Field Operations Manager

Getting people to work together, to believe in themselves, to take the lead and sustain participation are the most challenging parts of community work. Looking back at our humble beginnings, we are proud to see how the FARMCs and fisherfolk leaders were able to build and develop a powerful voice that is now being heard and respected throughout the fisheries industry.

Cara Gene
WWF Policy Advocacy Officer

PARTNERS IN PROMOTING SUSTAINABLE FISHERIES

Bureau of Fisheries and Aquatic Resources (DA-BFAR)

DA-BFAR is the government agency responsible for the development, improvement, management and conservation of the country's fisheries and aquatic resources. It was reconstituted as a line bureau by virtue of Republic Act No. 8550 (Philippine Fisheries Code of 1998) as amended by Republic Act No. 10654. The Bureau works under the Department of Agriculture.

Philippine Council for Aquaculture and Fisheries (DA-PCAF)

DA-PCAF is an attached agency of the Department of Agriculture (DA) which facilitates broad-based participatory processes in the agriculture and fisheries sector. It provides quality services to a nationwide network of private sector-led consultative councils at the national, developing policies and programs designed for the devvelopment of the agriculture and fisheries sector.

Department of Trade and Industry

The DTI is the executive department tasked with overseeing economic affairs. The DTI empowers and protects the rights of consumers, while developing policies and enacting programs that allow for the flourishing of innovative, competitive, job-generating businesses.

Pangingisda Natin Gawing Tama (PaNaGaT)

PaNaGaT is a coalition of fisherfolk organizations plus local and international nonprofit, non-government organizations which work on fisheries management and ocean conservation. To protect the livelihoods and uplift the lives of the country's two million fisherfolk, PaNaGaT has been working with the government to stamp out illegal, unreported and unregulated fishing to push for a transition to sustainable fisheries.

Gulf of Lagonoy Tuna Fishers Federation, Inc. (GLTFFI)

GLTFFI is composed of small-scale tuna fishers associations located in coastal communities across the Lagonoy Gulf. A peoples' organization representing the rights of small-scale fishers, the group lobbies for the passing of sustainable, equitable fisheries policies on a local and national level, while supporting the initiatives and the well-being of its members.

Oriental Mindoro Federation of Tuna Fishers Associations, Inc. (OMFTFA)

Based along the Mindoro Strait, OMFTFA is a peoples' organization consisting of tuna fishers' associations from Oriental Mindoro. Together with GLTFFI and with partner organizations like WWF-Philippines, OMFTFA pushes for the rights of its members and of small-scale fishers across the country in pursuit of sustainable, equitable practices.

Philippine Association of Tuna Processors, Inc. (PATPI)

An ally of OMFTFA, GLTFFI and small-scale tuna fishers across the Philippines, PATPI consists of local tuna processors committed to pushing for sustainability from hook to cook, all throughout the supply chain. PATPI works closely with small-scale fishers to close the gaps that keep the countries' tuna fisheries from becoming truly equitable and sustainable.

Philippine Tuna Handline Partnership (PTHP)

A coalition of tuna handline federations and processors, PTHP represents the interests of small-scale fishers on both a local and national level. PTHP is currently applying for Marine Stewardship Council (MSC) accreditation, making it the first organization of small-scale fishers to do so in the Philippines. PTHP is comprised of GLTFFI, OMFTFA and PATPI.

Tambuyog Development Center

Founded in 1984, Tambuyog called attention to declining fishery resources and unabated poverty in coastal communities through interdisciplinary research, creative information and education campaigns, community organizing, policy advocacy and constituency building. Tambuyog believes that communities ultimately are the best resource managers because they have the greatest stake in the preservation of resources which they depend on for survival.

Coop Switzerland

Coop Switzerland is among the largest wholesale and retail companies in Switzerland. Operating approximately 2200 stores and with a member base of around 2.6 million customers, Coop Switzerland is a leader in fast-moving consumer goods. The company manages department stores, supermarkets, pharmacies and more, while sourcing sustainable fishery products such as tuna from countries like the Philippines.

Federal Ministry for Economic Cooperation and Development (BMZ)

The Federal Ministry for Economic Cooperation and Development (BMZ) develops the guidelines and the fundamental concepts on which German development policy is based. German development policy is guided by the goal of improving living conditions for people in developing countries and emerging economies. BMZ works to move the world forward in cooperation with the international community to shape a positive, global future. It devises long-term strategies for cooperation with the various players concerned. BMZ commissions its implementing organizations to execute the German government's development projects.

DEG: Development Bank of Germany

Deutsche Investitions- und Entwicklungsgesellschaft is a Development Finance Institution and a subsidiary of KfW Group. It was founded in Cologne in September 1962 as a federally owned company by the former Federal President Walter Scheel. Since its foundation, DEG has been headquartered in Cologne.

Sea Fresh

Sea Fresh is a leading name in the field of import, export, and distribution of all kinds of fresh fish. They also carry and specialize in yellowfin tuna, providing freshly-caught fishery products sourced from countries like Sri Lanka and the Philippines. Sea Fresh looks to distribute sustainably-caught fishery products.

New England Seafood International

New England Seafood is a major supplier of fresh and frozen premium sustainable fish and seafood in the UK and one of the largest importers of fresh tuna. New England Seafood supplies the United Kingdom's leading supermarkets as well as smaller retails, sourcing an excess of 30 species from 40 countries across the globe. The company deals in responsibly-sourced fishery products.

Waitrose

First founded in England in 1904 as Waite, Rose and Taylor, Waitrose prides themselves on the quality of their products and the expertise of their staff as they seek ethical ways to source their groceries. Waitrose and Partners currently runs over 300 shops across the United Kingdom, and exports products from 52 countries.

Marks & Spencer

Marks & Spencer is a major international retailer whose headquarters can be found in London. Marks & Spencer carries a wide range of products, from clothes to food to furniture. The companies' brand is built upon its core values of quality, value, service, innovation, and trust, as they seek to make aspirational products available to all.

Sainsbury's

Sainsbury's is one of the largest supermarket chains in the United Kingdom. Founded in London in 1869, Sainsbury's focuses on quality, range and innovation in their offerings to their customers. The company has strengthened its commitment to becoming environmentally conscious, unveiling its new brand motto, "Helping everyone eat better" in 2021.

Bell Food Group

Bell Food Group is one of the leading processors of meat and convenience products in Europe and is market leader in Switzerland. The company was first founded in 1869 in the city of Basel, Switzerland. Bell Food Group carries fresh meats, poultry, charcuterie and sea-food, as well as ultra-fresh, fresh, and non-perishable convenience food products.

Local Government Units:

This programme would not have been possible were it not for the help of the Local Government Units (provincial and municipal) along the Lagonoy Gulf and Mindoro Strait. WWF would like to thank the LGUs of Lagonoy Gulf, namely Caramoan, Presentacion, Lagonoy, San Jose, Tigaon, Sagnay, Tiwi, Malinao, Tabaco City, Malilipot, Bacacay, Rapu-rapu, San Andres, Virac and Bato. WWF also thanks the LGUs of Mindoro Strait, namely Paluan, Mamburao, Sta. Cruz, Sablayan, Calintaan and Rizal for the support they have lent, and continue to lend, to the wellbeing of our fishers and the sustainability of their livelihoods.

WHAT YOU CAN DO TO SUPPORT SUSTAINABLE TUNA FISHERIES

Fisheries can be sustained only if buyers support the industry.
Please buy locally sourced and sustainably caught seafood, identifiable via their ecolabels.

Kindly refrain from buying juvenile tuna and threatened species like sharks and manta rays.

Spread the word about sustainable fisheries through social media and if you ever meet fisherfolk, please be extra nice to them. They might just share a tale or two about the sea.

WWF-Philippines has been working as a national organization of the WWF network since 1997. As the 26th national organization in the network, WWF-Philippines has successfully been implementing various conservation projects to help protect some of the most biologically-significant ecosystems in Asia.

WWF-Philippines works to improve Filipino lives by crafting solutions to climate change, providing sustainable livelihood programmes, and conserving the country's richest marine and land habitats.

Working to sustain the natural world for the benefit of people and wildlife.

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For contact details and further information, please visit our website at **wwf.org.ph**