

Fishing for a Management Strategy:
The Threat to Panamanian Pacific Shark
Populations



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Abstract

Sharks, as top predators, are an essential part of the Pacific marine ecosystem, but their populations have been steadily declining due to increases in commercial fishing. In Panamá, they are targeted by both industrial and artesians fishers who are responding to high domestic and international demands for shark meat and very high Asian demands of the fins for shark fin soup. Sharks are thus entrenched in Panamanian society as both a food and revenue source, making it difficult to regulate and protect them. The objectives of this study are to examine the extent of this and the methods and people involved in order to identify effective management strategies. Various groups are beginning to form with the goal of shark conservation, but face a number of challenges in balancing their ecological, social and economic importance. Studying the methods and people involved in the industry shows they are not going to sustainably manage themselves and need an outside entity, the Panamanian Maritime Authority, to provide management that will maintain shark populations for the ecological and economic benefits of future generations.

Sumario Ejecutivo

Los objetivos de esta investigación fueron, entender la situación de los pescadores de tiburones en Panamá y como dirigirlos para el beneficio del ambiente marino, la gente quien depende en los recursos marinos.

Poblaciones de tiburones en el Pacífico están en peligro por la pesca comercial. Porque tiburones están arriba de la cadena alimenticia marina, tienen un papel muy importante para mantener la salud y función de la ecosistema marina. Los tiburones maduran despacio y tienen poco bebés, y por eso es un especie sensitiva a la sobreexplotación. En los cinco a diez años pasados, la cantidad de tiburones alrededor Panamá ha bajado, dicen pescadores y científicos. Eso es una repuesta a la demanda alta para la carne en Panamá y extranjeros y las aletas en Asia.

En Panamá, están capturando tiburones puntas negras, azules, oceánicas, trompa blancas, puntas blancas, toros, tigres, sierras, zorros, cornudas y martillos. Según los pescadores, los más comunes y con lo más valores son martillos, toros, tigres y puntas negras. Capturan de todos los tamaños de dos pies hasta dos metros de 40 libras.

Ahora, hay solamente una ley en Panamá sobre tiburones. Dice la ley :que necesitan una licencia de Pargo, Mero y Tiburón (PMT) para pescarlos con barcos mayores de diez Toneladas de Registro Bruto (TRB). También, hay una regulación que dice un barco puede tener hasta diez por ciento del peso de su carga de tiburón incidental sin una licencia. Incidental es cuando captura tiburón accidental mientras pescando por otros especies como atún. Para cualquier infracción de la ley PMT, necesita pagar una multa hasta Bl.1,000. Botes artesanales solo necesitan un Permiso Artesanal que permite la pesca para cualquier especie y cantidad.

En el 2004 había 228 botes industriales con la licencia PMT. Usan los barcos industriales palangres con anzuelos grandes para capturar tiburones. Los palangres pueden estar 20 a 30 millas con 1,500 anzuelos. Dejando el palangre en el agua por cuatro a seis horas por vez y pueden traer 100 a 20,000 libras de tiburón en un viaje de 12 a 18 días.

Los botes artesanales usan palangres más pequeños de 10 a 15 millas con alrededor 700 anzuelos. Sus viajes son dos a seis días con un tripulación de dos o tres personas en un bote pequeño y cuatro a seis en botes más grandes. También, muchos usan redes para camarones y peces pequeños, pero capturan bastante tiburones pequeños. No hay estadísticas del estado sobre el número de botes artesanales que pescan tiburones ni la cantidad de tiburones capturados.

Recién, un grupo nacional formado para hacer un Plan de Acción Nacional sobre tiburones, este grupo se llama PAN-Tiburón, está dirigido por el Departamento de Recursos Marinos y Costeros de la Autoridad Marítima de Panamá e incluye la participación de grupos conservacionistas, el Servicio de Marítima Nacional, Grupo de Pescadores Artesanales y la Universidad Nacional de Panamá. Sus metas son para medir y analizar las poblaciones de tiburones y hacer un plan para su protección y el sustento de los pescadores. Eso es un ejemplo bueno de un plan, pero falta un horario de acción y no hay recursos para hacerlo.

En conclusión, es necesario que AMP dirigir los recursos tiburones con una sistema de licencias de tiburones artesónales y un mejor sistema de inspección y pesando de botes industriales, y parte de esta necesita incluir educación de los empleados y los pescadores.

Introduction

According to scientists and fishers shark populations in the Pacific are steadily decreasing while every year there are more and more commercial fishing boats targeting them. The high demand for shark meat in Panamá and the United States and the ever increasing demand and price for shark fins in Asia are driving the exploitation of this fragile and important marine resource.

Recently, much international attention has been paid to sharks by non-governmental organizations lobbying the United Nations to declare particular species endangered and to pass an international ban on finning on the high-seas. Finning, the practice of catching sharks, removing their fins and throwing the bodies back in the ocean to die poses an enormous threat to shark survival in the near future. It happens because fins have become so valuable pound for pound in Asia that often it is more lucrative to dump the shark bodies in order to save space for the fins. But this is only part of the problem.

In Panamá there is a strong demand for the shark meat itself, and the big industrial boats in the country are only rarely finning their sharks because it is lucrative to sell the meat as well. This makes the issue of conservation of sharks more complicated because they are entrenched in Panamanian society as both a major food and nutrient source and a common income for thousands of fishers. Currently, there are plans on the international, regional and national levels to try and protect shark species, but not always with regards to the true social and economic aspects of the trade.

This study seeks to answer the question, What are the impacts of the shark market on the Panamanian fishing industry and how can it be successfully managed?

Methods

This project included a mixture of interviews, observation and independent research. Two and half weeks were spent mostly at the Port of Vacamonte and the Mercado de Mariscos in Panamá City with visits to the Ports of Caimito and Llano Bonito. A series of informal, unstructured and semi-structured interviews were conducted in offices, in the markets and around the port. An informal interview is very conversational, without taking notes and without a set of specific questions in hand, but with a general guiding subject. An unstructured interview has a set of guiding ideas and questions to be answered, but informally. A semi-structured interview is with a set of written questions asked directly. These interviews made up the majority of the information collected.

Interviews with government officials in the Panama Maritime Authority (AMP) and Ministry of Commerce and Industry (MCI) and non-governmental organizations were semi-structured with questions directly asking about their role and specific inquiries about the shark industry. Talking to fishers on their boats and on the docks ranged from unstructured to semi-structured. There were a set of basic questions asked to all, but then often the discussion would end up going in different directions depending on what was found. Notes were taken in front of the interviewees for these. Almost all the interviews with industrial captains and crews were done in the presence of AMP inspectors who made the introductions, then would wait there during the interview. Talking to vendors, particularly at the Mercado de Mariscos, was generally informal and conversation like where notes were written later. The conversations would be guided by big questions and the interviewee generally directed it. The process of finding vendors and artisan fishers was very casual and happened by talking to a series of people in the area until they identified a particular person of interest.

During and apart from these interviews was constant observation of the process and atmosphere, and in some cases about actual shark catches and sizes. These first hand observations supported and sometimes helped guide interviews. Finally, the ecological situation of sharks was researched in studies and books and essentially a literature review of the topic.

Status of Sharks in Panamá's Pacific

Sharks are still a largely mysterious species to both the public and scientific communities. They are difficult to count and track because they inhabit such an expansive and changing underwater habitat, so there are not definitive studies recording shark depletion in Panamá's Pacific, but a number of subjective accounts from all groups of people agreeing that the populations are steadily and rapidly decreasing.

In Panamá's Pacific the following are 12 commonly found species¹:

Common Name (English)	Common Name (Spanish)	Scientific Name
Black Tip	Punta Negra	Carcharhinus limbatus
Blue	Azul	Prionace glauca
Oceanic	Oceánico	Carcharhinus longimanus
White Trumpet	Trompa Blanca	Nasolamia velox
White Tip	Punta Blanca	Carcharhinus albimarginatus
Bull	Toro	Carcharhinus leucas
Tiger	Tigre	Galeocerdo
Sierra	Sierra	Pristiophorus nudipinnis
Thrasher	Zorro	Alopias superciliosus
Scalloped Hammerhead	Cornuda	Sphyrna zygaena
Hammerhead	Pez Martillo	Sphyrna lewini
Hammerhead	Martillo	Sphyrna

Of these, the most commonly captured according to fishers are the hammerheads, bull sharks, tiger sharks, black tip, white tip, thrasher and blue sharks.² The hammerhead and bull shark are said to have the most value, the hammerhead for its fins which have the most fibers of all the species, but dark meat which is less desirable than white and therefore cheaper.³ Bull sharks also have valuable fins and meat.⁴

Ramirez and Medina who conducted the only major report on Panamá's shark fisheries suggest that the late 1980's saw a major increase in shark fishing in Panamá due to the increasing market for fins, followed in the 1990's by increased efforts to obtain the meat as well for consumption.⁵

An evaluation of Montijo Gulf in 2004 showed that shark populations are declining and in need of immediate attention to ensure their sustainability in the area.⁶ This matches reports from fishers who say populations are down in all of the national waters and therefore they have to travel farther and for longer periods of time to capture

¹ AMP, *Informe*. (Ramón, 2004).

² 8C Crew 2005, 9C Captain 2005, 14D Captain 2005, 18F Captain 2005, 20G 2005

³ 14D Captain 2005

⁴ 9C Captain 2005

⁵ Ramirez, Medina, *Diagnóstico Pesquero del Recurso Tiburón en Panamá*. (1999)

⁶ *Evaluación del Recurso Pesquero en el Golfo de Montijo*. (2004).

sufficient amounts of sharks and other species.⁷ One captain estimated that there are less than half the sharks today than 10 years ago.⁸

One reason it is especially important to monitor and manage these declining populations is because sharks are what are known as k-species meaning they grow slowly, mature late, reproduce seasonally and produce few large young. This makes them exceptionally vulnerable to overexploitation because they can take many decades to recover.⁹ Additionally, these fishers are commonly capturing small, young sharks before they have a chance to reproduce which causes further detriment to fragile populations. One fisher related that they do not target small sharks, but if when you bring in the line and they are already dead, it does not really matter.¹⁰ Likewise it is dangerous to bring in too many of the larger individuals which can lead to recruitment over fishing where so many adults are taken they can not maintain the level of the population.¹¹

Sharks play an important role at the top of the food chain maintaining and controlling other populations. They prey on a wide variety of species¹² and generally, help maintain the fitness of these species by eating sick and weak individuals. Additionally, they main steady population levels meaning the removal or decimation of shark populations can lead to population crashes of other species. When a top predator such as sharks disappears or is reduced significantly, the next trophic level of fish without predation booms, thus decimating the following trophic level and eventually crashing themselves when their food supply runs too low.¹³ This means the over fishing of shark populations is likely to upset populations of other important industrial fish such as tuna and dorado which are common prey for larger sharks and crucial income sources for all classes of fishers in Panamá.

Demand For Shark

Sharks have a number of usable parts that are all bought and sold separately. As demand for these items changes, so does the shark fishing industry. Domestically, there is a high demand for shark meat, while internationally there are demands for the meat, fins, cartilage and sometimes skin.

Meat

Shark is a typical consumption fish in Panamá. The meat comes in two classes, white and dark.¹⁴ The white meat is much preferred and carries a higher price than the dark, which is usually from hammerheads or tiger sharks.¹⁵ The meat is cut into fillets, chopped for ceviche or dried.¹⁶ In the Mercado de Mariscos there are generally white meat shark fillets under the name “corvinata” and giant bowls of shark meat ceviche for sale to the public. When asked, most fishers and government officials will say Panamanians eat plenty of shark, and for artesian fishers, this is their primary market. Large hotels can purchase 2,000 to 3,000 pounds of shark for one weekend.¹⁷ There has

⁷ 7B Captain 2005, 17E Captain 2005, 26I Crew 2005

⁸ 9C Captain 2005

⁹ Watts, *The End of the Line?* (2001).

¹⁰ 17E Captain 2005

¹¹ Larkin, *Fisheries Management – An Essay for Ecologists*. (1978).

¹² Larkin, *Fisheries Management – An Essay for Ecologists*. (1978).

¹³ Watts, *The End of the Line?* (2001).

¹⁴ 2 AMP Official 2005

¹⁵ 18F Captain 2005, 7B Crew 2005

¹⁶ 3 AMP Official 2005

¹⁷ 12 Vendor 2005

been a steady increase in domestic shark meat consumption from 1998 to 2002, with 605 tonnes of shark in the national market in 2002 according to the AMP.¹⁸

The vast majority of shark meat exported from Panamá is destined for the United States, with much smaller amounts going to Taiwan and Costa Rica. In 2003, Panamá exported 367,847 kilograms of shark meat for \$810,660. The United States share of this was 367,447 kilograms and \$810,000, equal to 99.9 percent of the total.¹⁹

Panamá Ministry of Commerce and Industry
REPORTE DE EXPORTACIÓN

3026500 ESCALOS

MERCADOS	P E S O N E T O				
	1999	2000	2001	2002	2003
ESTADOS UNIDOS	40,880	0	203,968	408,812	367,447
COSTA RICA	0	0	0	0	400
TAIWAN	4,780	0	0	0	0
TOTAL	45,640	0	203,968	408,812	367,847

Off the boats (either industrial or artesian), white shark meat is generally sold for between 30 and 40 cents per pound, but sometimes as much as 50 cents per pound. Dark meat sells for around 25 cents per pound.²⁰ After this, the meat has to be processed (cleaned, cut, packaged) which can add around 40cents per pound, then distributed, which can add another 40cents per pound including the cost for gasoline, salary of driver, ice and the truck, then there are financing fees for the distributor which can add another 30cents per pound meaning that shark bought off the boat for 30cents per pound will end up costing \$1.20 per pound, and then sold to restaurants and hotels for around \$2.00 per pound.²¹ This results in a profit of around 40 percent for the distributor and a total price inflation of about 85 percent.

Fins

By far, the most valuable part of the shark pound for pound is the fin, almost all of which are exported to Asia. Most industrial boats sell their fins directly to companies with plants for processing fins in Vacamonte.²² In Panamá City there are two additional plants that buy the fins directly from artesian boats and vendors for processing and shipping.²³ In the past several years demands for fins have increased, and subsequently so have the prices that plants are willing to pay fishers for the product, making fins an extremely important and valuable part of fisher incomes. As one said, shark is the most important of all the fish because it means the most money the fastest,²⁴ which is largely due to the efficiency and speed of the market for fins. This demand is constantly growing as populations in China are increasing rapidly and creating a larger upper middle-class with disposable incomes for such things as shark fin soup²⁵, while at the same time shark fin products are becoming cheaper and more widely available in the form of canned and even instant soup.²⁶ Between 1996 and 2000 the trade grew more than five percent per year and a medium sized operator was reported to be making a turnover of US\$771,000 per month.²⁷

¹⁸ AMP, *Informe*. (2004)

¹⁹ MCI, *Reporté de Exportación*. (2005)

²⁰ 20G Crew 2005, 18F Captain 2005, 12 Vendor 2005

²¹ 12 Vendor 2005

²² 7B Crew 2005, 18F Captain 2005

²³ 11 Vendor 2005

²⁴ 14D Captain 2005

²⁵ Watts, *Shark Finning: Unrecorded Wasteage on a Global Scale*. (2003)

²⁶ Gang Hai Food Factory, *Product Annoucement*. (2002)

²⁷ Watts, *Shark Finning: Unrecorded Wasteage on a Global Scale*. (2003)

Large fins of 10 inches or more are sold off the boat for between \$35 and \$38 per pound while the smallest ones of just a few inches are sold for no less than \$2.50 per pound.²⁸ Species also makes a difference in price, hammerheads being the most valuable because their fins contain the most fibers.²⁹ After processing, shipping and preparation in a restaurant a single bowl of the shark fin soup in Taiwan can sell for up to US\$100 per bowl.³⁰ Locally, a bowl of shark fin soup in Panamá City sells for \$6 to \$7 in Restaurants.³¹

It is difficult to estimate the amount of shark fins being exported because in the system of international commerce they are classified in a section called “other” with the title “Products of animal origin, not classified in any other part; dead animals from chapters 1 or 3 (3 is seafood) improper for human nourishment.”³² This category also contains any number of other items, but the exports to Hong Kong, Mexico and the United States are consistent with reports from Panamanian fishers and vendors as companies they send fins to. Recorded exports of this “Other” section decreased between 2000 and 2003 with Hong Kong, the United States, Mexico and Honduras as the countries consistently receiving the most fins over the years. To further complicate the issue, some companies recorded to be exporting fins are using different numbers than the one above from the MCI guide book, all also titled “Others”.³³ This could account for the absence of China and Japan on the export list even though fishers and vendors in Panamá report to be sending fins there.³⁴ The World Trade Atlas offers different numbers from those of MCI for dried shark fins which reflect much higher exports to Hong Kong, China and Singapore, but still appear too low and incomplete as they are missing datasets for various countries and years.³⁵

Panamá Ministry of Commerce and Industry

5119190 LOS DEMÁS, PRODUCTOS DE ORIGEN ANIMAL, NO EXPRESADOS NI COMPRENDIDOS EN OTRA PARTE, ANIMALES MUERTOS DE LOS CAPÍTULOS 1 O 3 IMPROPIOS PARA LA ALIMENTACIÓN HUMANA.

MERCADOS	P E S O N E T O				
	1999	2000	2001	2002	2003
CANADA	0	9	181	0	0
ESTADOS UNIDOS	10,969	44,040	55,578	4,571	933
MEXICO	0	1,813	12,577	15,373	11,487
GUATEMALA	0	580	1,090	954	318
EL SALVADOR	0	0	0	0	90
HONDURAS	0	299	2,113	1,133	3,175
NICARAGUA	0	0	0	3,401	0
COSTA RICA	117	27,854	20,390	3,401	0
REP. DOMINICANA	0	0	0	22	0
ARUBA	0	7,008	0	0	0
CURAZAO	36,908	124,661	7,416	0	0
ECUADOR	0	5,743	18,526	10,886	0
VENEZUELA	0	0	1,360	0	0
GUYANA	0	0	0	0	5,800
FRANCIA	1,700	5,000	3,350	0	0
ITALIA	0	213	0	0	0
POLONIA	0	0	10	0	0
REP. POPULAR CHINA	0	0	600	0	0
HONG KONG	3,135	17,679	6,932	707	3,478
T O T A L	52,829	234,899	130,523	40,448	25,281

Other Products

The other main export people refer to is cartilage, which is sold to Germany where it is used medically to help with mental afflictions. There is one company that operates in Vacamonte and processes and sells the cartilage.³⁶ Shark skin is also sometimes used for belts or shoes, but the demand is small and difficult to track.³⁷

²⁸ 20G Crew 2005, 3 AMP Official 2005

²⁹ 14D Captain 2005

³⁰ Watts, *Shark Finning: Unrecorded Wasteage on a Global Scale.* (2003)

³¹ Restaurante Sunly, El Dorado

³² MCI, *Productos Exportados.* (2004)

³³ AMP, *Directorio de Exportadores de Productos del Mar.* (2003)

³⁴ 18F Captain 2005

³⁵ Wild Aid 2003

³⁶ 3 AMP Official 2005

³⁷ 3 AMP Official 2005, 12 Vendor 2005

Shark Fishing in Panamá

The shark fishing industry in Panama takes on many forms from the giant international tuna industrial boats to Panamanian semi-industrial boats to small artisan fleets. All of these boats can be found throughout the Pacific and all are bringing in significant numbers of shark whether on purpose or as a result of by-catch while fishing for other target species. Each sector is regulated by different laws and enforcement structures that affect the people and methods they use. It is important to understand these differences in order to properly regulate and enforce the industry in the most efficient and productive way possible.

Semi-Industrial Boats

Semi-industrial boats fish throughout Panama's Pacific primarily for shrimp, tuna, dorado, snapper, mero and shark. In 2004, there were 228 of these boats licensed to catch shark in Panama.³⁸ Almost all of them are also licensed to catch tuna or dorado and bring in a variety of species from every trip. Because they are so large and tend to only dock at a limited number of ports, the AMP is able to keep some records of the catches from these boats. In some ports they record the weight of shark meat and fins separately, but in other ports only have one section for shark without a separate measurement for fins, and other ports are missing entirely from the data set. Their 2004 data reflects shark brought into the ports of Vacamonte, Mutis, Panama, Mensabe, Coquira and Pedregal, but for instance, there is a small fleet of semi-industrial boats also fishing for shark coming into the port at Llano Bonito which are not reflected in this data. Additionally, there is no distinction between species because the shark's heads and fins are removed when they are caught making it extremely difficult to identify them upon arrival in the port. The fins are stored separately in bags for sale separate from the meat of the shark. Finally, it is the captains of the boats who actually weigh and report their catches.³⁹ This has the potential to skew the accuracy of the reports, particularly for sharks where a boat can be fined up to a \$1,000 for bringing in too much unlicensed shark. According to AMP data, boats with shark licenses brought in 42,998,701.78 lbs of shark and 1,087,744.80lbs of fins in 2004.

AUTORIDAD MARITIMA DE PANAMA (2004)

<i>Port</i>	<i>Shark (lbs)</i>	<i>Fins (lbs)</i>
Vacamonte	42,591,053.78	1,080,263.80
Mutis	1,810	-
Panama	372,563	-
Mensabe	24,326	519
Coquira	8,949	6,962
Totals	42,998,701.78	1,087,744.8

³⁸ AMP, *PMT Licencias*. (2004)

³⁹ 15 AMP Official 2005

These semi-industrial boats are almost entirely owned by companies that manage the operation and sale of the boats and catches. Companies are technically anyone who owns more than three boats, but often are much larger and internationally run.⁴⁰ They designate when boats come and go, which ports they dock and unload in and own all of the equipment used. Once boats come to port, they unload and the company takes over bringing the fish to processing plants for cleaning, filleting and if exporting, shipping.⁴¹ In 2004 AMP listed 11 companies that were exporting shark in some form out of Panama.⁴² Independent semi-industrial boats operate similarly in the water and then sell their contents on shore to the company offering the best price.⁴³

For catching shark, all the semi-industrial boats use long lines, which can be 20 to 30 miles long with as many as 1,000 to 3,000 hooks hanging down on perpendicular lines.⁴⁴ The hooks range in size depending on target species, with shark specific hooks larger than all other industrial species. The next biggest are tuna hooks, which also catch a large number of sharks. Many boats fish for tuna and shark at the same time, maximizing on this fact.⁴⁵ These lines are usually baited with sardines or squid⁴⁶ and left in the water from four to five hours at a time over the course of 11 to 14 hour days.⁴⁷ They go out for trips that generally last 12 to 18 days, but sometimes as long as 20 depending on what they say is their luck, or how long they need to catch sufficient fish to cover their operation costs and still make decent pay.⁴⁸ In one trip they can bring in anywhere from 2,000 to 25,000 pounds of fish⁴⁹, and sometimes on bigger ships up to 40,000 pounds on a good trip.⁵⁰ Of this, ranges of shark vary greatly from boat to boat, depending on what their target species are and how many shark specific hooks they are using. One boat will consistently bring in 10,000 to 15,000 pounds of shark⁵¹ while another may range from 2,000 pounds up to 17,000 or even 20,000 pounds of shark in one trip.⁵² These sharks generally range in size from 10 to 40 pounds, but sometimes are as large as 100 pounds⁵³, meaning they could be capturing around 100 to 600 sharks per trip. This range times two trips per month for 228 boats equals the potential capture of 45,600 to 273,600 sharks per month by semi-industrial boats alone. The weight of shark brought in is just body and fins, as the head and internal parts are removed upon capture.⁵⁴

⁴⁰ 2 AMP Official 2005

⁴¹ 5A Captain 2005, 6A Crew 2005

⁴² AMP, *Directorio de Exportadores de Productos del Mar*. (2003)

⁴³ 14D Captain 2005

⁴⁴ 2 AMP Official 2005, 18F Captain 2005, 24H Captain 2005, 7B Crew 2005, 8C Crew 2005, 9C Captain 2005, 5A Captain 2005

⁴⁵ 3 AMP Official 2005

⁴⁶ 7B Crew 2005

⁴⁷ 17E Captain 2005, 18F Captain 2005

⁴⁸ 5A Captain 2005, 14D Captain 2005, 17E Captain 2005

⁴⁹ 17E Captain 2005, 18F Captain 2005

⁵⁰ 24H Captain 2005

⁵¹ 14D Captain 2005

⁵² 17E Captain 2005, 18F Captain 2005

⁵³ 9C Captain 2005

⁵⁴ 2 AMP Oficial 2005



An example of a semi-industrial boat, a long line on a reel with hooks in a crate, and a hook and snap.



Crates of sharks of different sizes being unloaded from a semi-industrial boat.

The operation of these semi-industrial boats ranges from \$4,050 to \$7,000 per trip.⁵⁵ This includes gasoline, all the equipment and food for the crew. The captains and crews are paid percentages of the sale of each trip. The exact percentages and pay structure vary per company, but they always take the total sale and immediately subtract the operation costs.⁵⁶ Then, a portion is taken for the company, a portion for the captain and the rest split amongst the crew. For many companies it comes out to two parts for the company, one for the captain and one part split amongst the crew members.⁵⁷ This often comes out to about two to three percent of the total catch. Some companies just pay the two or three percent, ensuring a minimum which protects against problems such as occasionally high equipment costs that could equate to significantly less money for the crew.⁵⁸ Shark fishing in particular has inherently higher operation costs than other major industrial species. Hooks for sharks are bigger and more expensive than others. At one principle fishing equipment store in Panamá, shark sized hooks were 36 cents each, while others were as low as 24 cents each. Also, unlike other fish, sharks often bite through the lines resulting in a loss of the hook and line which need to be replaced much more frequently.⁵⁹ To address this, some boats use metal chords on the ends of the plastic lines so the sharks can not bite through, but these are very expensive and often are only used on a portion of the lines.⁶⁰ In all cases, the higher operation costs of shark fishing subtract more from the total income of a trip and equate to less pay to everyone, mostly affecting the crew.

It is common for a semi-industrial boat to bring in between \$10,000 and \$40,000 per trip which depends on how much they catch of which species and what the current market prices are for them.⁶¹ After subtracting operation costs, this leaves from \$3,000 to \$36,000 to split into four parts of between \$750 and \$9,000. The captain receives one share of this and a crew of six (seven minus the captain) would each receive between \$125 and \$1,500 for one trip. This multiplied by two trips per month is a

⁵⁵ 17E Captain 2005, 24H Captain 2005

⁵⁶ 5A Captain 2005, 12 Vendor 2005

⁵⁷ 5A Captain 2005

⁵⁸ 7B Crew 2005, 8C Crew 2005

⁵⁹ 17E Captain 2005

⁶⁰ 9C Captain 2005

⁶¹ 5A Captain 2005

liveable income in Panamá according to many crew members, but most say it is not an easy life.⁶² They have long trips and are away from their families much. There are often crews from Chiriquí docking as far as Vacamonte to unload their catches and they tend to only have two to three days on land between trips. One crew member, when asked what he thought about the future of the industry said he would be worried about it, but he does not plan on doing this much longer because it is too tough and he misses his family. He is 27 years old and has been doing this for just 5 years.⁶³

Artesian Boats

Artesian boats are found in almost every port and dock on the Pacific side of the Isthmus. In 2004, there were 6,466 registered artesian boats on Pacific side (only 7 more were registered in Bocas del Toro).⁶⁴ There is no official record of how many of these are capturing sharks either purposefully or incidentally, but one report estimated that about 63 percent of artesian boats are catching sharks.⁶⁵ There are also no official data about the quantity artesian fishers are catching and selling or where. This presents the biggest obstacle in trying to estimate the extent of Panamá's shark fishing industry. Additionally, these smaller boats are more likely to be finning sharks since they have less storage space, particularly those sharks such as hammerhead for which the meat has a low price (most fish species and shrimp are worth significantly more than dark meat from a hammerhead). At the same time, the hammerhead has the most valuable fins, making it particularly vulnerable to this process.



Examples of artesian boats that use (1) long lines and (2) nets.

Many artesian boats are independent, some owned by large companies with around 10 boats and some by small “companies” which are really an individual who owns three or more boats and hires crews to work them all. In the Mercado de Mariscos in Panamá City there are a number of companies that own covered spaces that act as unloading zones, processing plants and shops. In this case, a company owns not only the space, but the boats and equipment as well. They pay the fisher a portion of the catch, but the vendors who work on land unloading, weighing, cleaning, processing and selling all receive a steady salary.⁶⁶ These companies are generally concentrated in Panamá City and only account for a small portion of artesian fishers. The rest are individuals who either own their own boats or work on boats owned by another individual locally.

The vast majority of artesian boats are using nets, but many also use long lines of similar design to those of industrial boats. The nets used range in size from 2 ¾ inch to 5 inches depending on the target species and availability of fish at the time. Many fishers move up the trophic levels, starting with a small net and if they aren't catching

⁶² 6A Crew 2005

⁶³ 5A Captain 2005, 6A Crew 2005

⁶⁴ AMP, *Licencias Artesenales*. (2004)

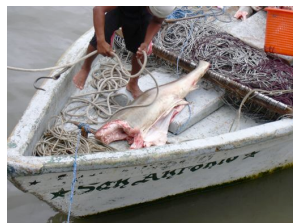
⁶⁵ Wild Aid XXXX

⁶⁶ 12 Vendor 2005, 26I Crew 2005

enough moving up to larger sizes until they can catch a sufficient amount.⁶⁷ One three day trip with a crew of two or three people using nets, can bring in 50 to 200 pounds of shark out of a total of 300 to 1,000 pounds of fish.⁶⁸ It costs about \$70 to \$80 to operate one of these small boats for one trip including gasoline food and equipment. New nets cost between \$90 and \$160 and there are usually four nets per boat that are used over a long period of time with the fishers repairing them by hand.⁶⁹

Boats using lines vary in size with smaller ones boasting a four person crew including the captain and larger boats carrying up to six people for seven to eight or even 12 day trips.⁷⁰ The lines they use are 10 to 15 miles long with around 700 large hooks.⁷¹ Many of these boats fish exclusively for shark bringing in from 200 to 1,000 pounds per trip, while others fish for a variety of species including shark, dorado, snapper, mero and cherna and others only catch shark incidentally. A larger long liner boat with a crew of six people on a twelve day trip can bring in 3,000 pounds of shark in one trip out of 7,000 to 10,000 total pounds of fish.⁷² The smaller of the boats cost \$1,000 per trip to operate using 170 to 180 gallons of gasoline and the larger ones cost around \$2,050 per trip.⁷³

Watching the process of unloading a small, exclusively shark boat with 600 pounds of shark ranging in size from almost three meters to the small “toyos” of about two feet illustrates how the high demand for this item really pushes small fishing fleets. They do not care what size or species they find because all are worth something. This particular trip included four people over four days using a long line docking in the Mercado de Mariscos in Panamá City. The fishermen unloaded the shark carcasses, then the vendors weighed and sorted it all into different crates depending on size, leaving a pile of about 10 of the largest bodies on the ground because there are no crates big enough for them. All day people come by the space which acts as a shop and buy meat or fins. Sometimes these are smaller local buyers seeking meat to satiate the hungry domestic shark meat market and sometimes larger more commercial companies who want fins to export. The meat is destined for ceviche or filleting, usually sold under the false name of corvinata in an effort to make it seem more appealing. Often, the fins are sent to plants in Vacamonte for drying and shipping, but the meat generally stays local. The fishermen will get paid within a day of coming into port after all the shark parts have been sold.⁷⁴



Unloading shark from the above trip, and portions of the separated cargo.

⁶⁷ 12 Vendor 2005

⁶⁸ 20G Crew 2005

⁶⁹ 20G Crew 2005

⁷⁰ 26I Crew 2005, 11 Vendor 2005

⁷¹ 26I Crew 2005

⁷² 26I Crew 2005

⁷³ 11 Vendor 2005, 26I Crew 2005

⁷⁴ 11 Vendor 2005, 28K Crew 2005, 29 Vendor 2005

This particular company splits the income 50-50 amongst the company and crew. The crew's 50 percent is then split into two shares for the captain and one share split amongst the crew. Crew per person pay can range from \$700 on a good trip to just \$100 on a bad trip. From the company, the vendors receive their monthly salary, which at this particular company is better than many others.⁷⁵

The sale of artesian caught fish is very different from industrial boats which tend to simply process on site and export their products. The Mercado de Mariscos is the largest artesian market in the country and facilitates every step of the process from the structure of the docks to daily and nightly commercial markets for artesian fleets. It has become a major center of operations with two major equipment stores across the street and two shark processing plants in the area. The main market was built with AID money from Japan and boasts their flag on the sign next to the Panamanian one⁷⁶. It is an open building where vendors rent space to sell products they buy directly off boats that come in all day to the docks behind the building. After vendors purchase the fish, they cut it themselves inside the market and sell all day to individuals and small businesses.⁷⁷ While this is the face of the market to the public, the main action happens nightly between midnight and six in the morning. It is a fitting late night operation for an industry rumoured to be saturated with mafia ties,⁷⁸ but has the very practical purpose of keeping the fish fresher by operating during the coolest part of the day. It is during this time that most boats line up and the big vendors come in, but like every other part of the industry, prices and availability always depend on the water.

During a low tide, the market is slow even on a Friday morning which is usually the busiest time with all the restaurants buying for the weekend. According to all the fishers and vendors prices for white shark meat generally range from 30 cents to 40 cents per pound. This fluctuates constantly depending on the supply and demand at any particular time. An abundance of boats with shark drive the prices down throughout the night during a waiting game of buyers visiting different fishermen and simply waiting until the fishermen get desperate and drop the prices, at which point the prices get agreed upon throughout the market and set, often not until two or three in the morning.⁷⁹ Other nights will only have a few baskets of shark, allowing that crew to raise the prices at the disadvantage of vendors. Following one such vendor (12) throughout the market demonstrated how the simple rules of supply and demand are what actually regulate the shark industry. He went in seeking 2,000 pounds of shark for a large client, but only found about 100 pounds lamenting that he should have bought earlier because now that seller would be asking for 40 cents per pound, which he could not afford. The options he listed included waiting until the tide came in between 3am and 6am with more boats, hopefully with more shark, driving to other ports hours away to find shark there at hopefully a cheaper price or waiting until the next day and trying to buy shark cheaper early in the morning that crews would be saving for sale at the next nights market.

This demonstrates how artesian fleets are the heart of the fishing industry in Panamá, but also how especially unpredictable and dependant on nature the seafood industry is. The people involved in the industry are accustomed to this, and while many echo the sentiment that there are far fewer sharks and other species now than before, they are used to adjusting. The above vendor explained that when there simply are not enough sharks to buy, he can usually substitute tuna. This flexibility is unique to fish

⁷⁵ 261 Crew 2005

⁷⁶ 22 AMP Official

⁷⁷ 10 Vendor 2005

⁷⁸ 28 Retired Vendor 2005

⁷⁹ 12 Vendor 2005

which, while they have unique qualities tend to be similar enough to trade. Additionally, while the actual fishers are generally aware of market demands and prices, when they are in the water they are catching what they can. If they can not find shark, they can switch and target tuna, or something else. Because it costs them \$1,000 to \$2,000 to operate a medium to large artesian boat for one trip, they need to bring in something at least to cover operation costs and then more to pay themselves. Therefore, the fishers are at the mercy of nature, and vendors at the mercy of fishers.

By-Catch

By-catch is the accidental capturing of sharks while targeting other species.⁸⁰ This particularly occurs among artesian fishers using nets and industrial and semi-industrial boats using long lines for tuna. International groups assessing shark populations explain that while this used to be considered a nuisance, now fishers are realizing the value of shark and often finning their by-catch.⁸¹ In Panamá, this depends on the space limitations of the vessel. Many artesian fishers view sharks not necessarily as by-catch, but as luck when they are fishing other species including tuna, dorado or even shrimp and usually bring in the bodies as well as fins. One medium sized long line artesian boat seeking other fish can bring in between 15 and 30 small sharks incidentally.⁸² Smaller boats using nets that by-catch shark are more likely to fin them due to lack of space, but still occasionally keep the bodies to sell, depending on if they are worth more or less than their target species. Since there are not regulations about what or how much artesian fishers can catch, there is no regulation of this by-catch.

Semi-industrial boats by-catching sharks are also keeping them, meat and fins, to sell.⁸³ In Vacamonte where the most industrial boats are found, there are also two plants that process shark and are always willing to buy.⁸⁴ These sharks are weighed and declared with the rest of the catch when the boats come into port, but without a license for shark, they can only have up to 10 percent of the total weight of their catch be shark. If they are over this, they can be fined up to \$1,000.⁸⁵ It is often questionable if the sharks claimed as by-catch are truly by-catch or were caught purposefully.⁸⁶ Also, it happens that if boats have too much shark to claim as by-catch, they will unload some onto other boats while out at sea, and bring it in as a separate boat's catch.⁸⁷

The hardest category of by-catch to measure is that of international boats fishing in Panamá's waters. Resolution number 003 of January 7, 2004 dictates that international boats can fish for tuna in what it defines as Panamá's national waters.⁸⁸ Tuna boats are notorious for by-catching sharks, but these boats have no real accountability to the AMP, and in Vacamonte dock in a separate private section apart from all the other boats. It is largely unknown the extent of shark they are catching and selling.

⁸⁰ McLaughlin, *Commercial Fishing for Sharks*. (2005)

⁸¹ Watts, *Shark Finning: Unrecorded Wasteage on a Global Scale*. (2003)

⁸² 11 Vendor 2005

⁸³ 31L Captain 2005

⁸⁴ 4 AMP Official 2005

⁸⁵ 32 AMP Official 2005

⁸⁶ 2 AMP Official 2005

⁸⁷ 12 Vendor 2005

⁸⁸ AMP, *Resolución Adm. No. 003 De 7 De Enero De 2004* (2004)

declaring ownership of the boat, proof of their fishing license, a copy of the registration of their boat containing all of its characteristics and size, a certificate of “Paz y Salvo” that proves their boat is safe by Panamá’s standards, a list of the crew and if re-applying, their prior PMT. The license is good for one year, and each year they must go through the same process to obtain a new one. Infractions of the law are punishable by a fine up to \$1,000. This license is reserved exclusively for Panamanian boats, meaning international ships are not allowed to fish these species in Panamanian waters.⁹⁴

The number of licences given out each year is determined by the Marine Resources department on recommendation from the Fishing Committee.⁹⁵ This committee was formed this year by law 59 and is made up of representatives from artesian groups, industrial fishers, tuna fishers, groups who use nets, groups who use long lines, the National Maritime Service, the National Authority on the Environment (ANAM), the national Health Center and conservationists and is headed by the Director of Marine Resources. Each of these groups chooses their own representative, and the Director is responsible for calling and running meetings. This group comes up with recommendations for Marine Resources for technical issues such as the regulation of net sizes and conservation issues such as regards shark populations. Marine Resources is not required to follow these recommendations, but uses them as guidelines for regulations and actions. The committee can also be used to distribute information through the representatives to their respective groups.⁹⁶

A qualifier for this law is another regulation that allows by-catch of shark up to 10 percent of the total weight of a catch for boats without a PMT.⁹⁷ Currently, the new director of AMP is trying to change this to a flat ton amount, but Marine Resources is still standing by the 10 percent rule.⁹⁸

The enforcement of the PMT law is up to inspectors at the ports who visually check the cargo of each boat and then review the weight of the cargo as reported by the captains of the ships and in Vacamonte a single patrol boat. The visual check is not extensive and is ineffectual for anything but noting if there are sharks and a long line present. The single boat for patrolling the water is not nearly enough for such and expansive area.⁹⁹ Furthermore, since the captains weigh and report their own catches, they are unlikely to report having shark that would land them a large fine. If they do find a boat without a PMT and with more than the legal amount of shark they confiscate all the shark and report them to the main office in Panamá City which deals the fine and can suspend their fishing license until paid, but current officials have never seen this happen.¹⁰⁰ Finally, Marine Resources only has inspectors at 15 Pacific ports and some only have one or two staff. The rest of the coast is unpatrolled and illegal catches and landings are prevalent.¹⁰¹

⁹⁴ AMP, *Decreto Ejecutivo No. 49* (1992)

⁹⁵ 21 AMP Official 2005

⁹⁶ 22 AMP Official 2005

⁹⁷ 21 AMP Official 2005

⁹⁸ 32 AMP Official 2005

⁹⁹ 4 AMP Official 2005

¹⁰⁰ 15 AMP Official 2005

¹⁰¹ 2 AMP Official 2005

Table 1 AMP Marine Resources Staff Per Port
(From “Lista Personal” de Recursos Marinos, 2005)

Port	Inspectors	Bosses	Administrative Staff	Total
Vacamonte	13	1	8	22
Mercado de Mariscos	8	2	3	13
Panamá	3	0	0	3
Cristobal	1	0	1	2
Coquira	2	0	0	2
Caimito	1	0	0	1
La Palma	5	0	0	5
Aguadulce	3	1	0	4
Pedregal	2	2	2	6
Mensabe	4	2	1	7
Armuelle	1	0	0	1
San Carlos	1	0	0	1
Remedios	1	0	0	1
Boca Parita	3	1	1	5
Obaldia	1	0	0	1
Mutis	7	0	0	7
Total	56	9	16	81

For artesian boats, they only need the Artesian Permit which notes if they catch shrimp or fish, use nets or lines and their home province. With this, they are free to catch as much of whichever species they can.¹⁰² The only stipulation of this within the PMT law is they are restricted from using nets to capture snapper or in the water where snapper live.¹⁰³ Boats from Marine Resources patrol the waters approaching artesian boats to check their licences and papers. If they are caught using an illegal net, Marine Resources officials take it and report them to the main office for a fine.¹⁰⁴ Artesian fishers asked were aware of these regulations and their consequences.

Obstacles to Regulation and Conservation

The conservation of what is left of Pacific shark populations is important to both marine life and the livelihoods of people who rely on the income from catching shark. Maintaining the sustainability of natural resources is always a complicated task, and even more so with marine resources which are incredibly expansive and difficult to study and patrol. To further complicate the issue are the unique dynamics of the shark market and demand side challenges. Both natural and institutional obstacles are important to recognize and understand in order to effectively regulate and maintain the shark industry in Panamá.

¹⁰² 15 AMP Official 2005

¹⁰³ AMP, *Decreto Ejecutivo No. 49* (1992)

¹⁰⁴ 20G Crew 2005

Natural Obstacles

Marine ecosystems offer unique challenges to their assessment, conservation and quantitative evaluation. For one, it can be extremely difficult to truly assess shark populations because of the expansive area they inhabit. Their feeding patterns and life cycles are likewise difficult to study since all occur underwater.¹⁰⁵ This presents challenges not just to the current assessment of populations, but to the measurement of success of conservation initiatives. Such measurement is essential, so groups know not just when they have achieved their goals, but so they can learn what is and is not effective for future projects. Therefore, groups concerned with fisheries need to think creatively about how they can objectively measure their goals. One obvious way is to look at cargo statistics and extrapolate information from the increase and decrease of semi-industrial catches. The inherent problem in this is that if semi-industrial boats back off of sharks, it is likely artisanal boats will pick up the slack. Artisanal boats already complain that industrial boats with their giant long lines are over fishing areas and species the smaller boats depend on for their income,¹⁰⁶ and would easily be able to catch more if the larger boats were limited in their catches. Fishing crews themselves can offer valuable information about the area, species and relative abundance of sharks, but this information must be collected personally because the statistics do not tell the whole story. This presents a challenge in finding the personnel necessary to conduct such extensive interviews that would yield substantial information and results. One approach would be to create surveys that ask for information about where catches are occurring and relative abundance that AMP inspectors administer when they are checking semi-industrial boats coming in to dock. In order to balance this information with data from artisanal boats, it would be useful to take advantage of the organization of the various “associations” and co-ops that exist amongst artisanal fishers to administer similar surveys within their groups.

The expansive area of Panamá’s waters stretching out 200 nautical miles also creates a major problem in patrolling and enforcing any marine regulation. There are expansive areas where boats can go virtually unseen and practice however they choose. This area also offers hiding space for illegal practices such as unloading one boat’s catches on to others to evade fines for having too much by-catch shark. And AMP does not have nearly enough boats to sufficiently patrol these waters.¹⁰⁷ Additionally, there is the entire Pacific coast of Panamá which has 46 sites to dock and unload at, only 15 of which have AMP staff. As long as they can transport fish to a plant, boats can choose to dock wherever is easiest. This means they can weigh, unload and sell their cargo unseen, only reporting what they choose. Fortunately, it does appear that most boats dock at patrolled ports because that is where plants, companies and markets are operated from, but the option exists. The simple way to address this is to increase the capacity in personnel and number of boats AMP has and uses, but these resources are not easily available. Another option is to regulate where industrial boats can dock, so they can be more strictly monitored. Currently, all shrimp boats are required by law to dock at Vacamonte because each time they come in they must be inspected to ensure they have Turtle Excluding Devices that are used and to code.¹⁰⁸ Such a regulation of shark boats would help with the inspection of any new regulations and could aid in ensuring more accurate reports of shark catches.

¹⁰⁵ Larkin, *Fisheries Management – An Essay for Ecologists*. (1978)

¹⁰⁶ 20G Crew 2005

¹⁰⁷ 4 AMP Official 2005

¹⁰⁸ 15 AMP Official 2005

Additionally, this large area offers expansive habitat for the sharks, which are not confined to any particular smaller area that can be more easily protected. While most shark fishing is concentrated off the coasts of Chiriqui, Darien and to the south of the islands in the Bay¹⁰⁹, it is by no means limited to these areas. This means that to effectively protect populations all the waters need to be monitored, which is impossible for the current AMP and its resources. Furthermore, this massive habitat crosses the borders of many countries throughout Central America, Columbia and Ecuador. Therefore, it is not enough for one country to regulate because the sharks will still be in danger as they move north and south. Costa Rica recently passed an anti-finning law, but since no other Central American country has similar legislation, this only has limited protection power. Truly effective legislation would require the cooperation of all of Central America, Columbia and Ecuador. This could be achieved through international bodies such as the United Nations or ICAT or through regional treaties and agreements.

Institutional Obstacles

Some of the most complicated obstacles are those inherent in the system and industry of fishing. There are numerous stakeholders all over the world who participate in the shark trade and apply pressure in their own interests. The trade itself is increasingly more competitive every year and many fishers complain about the increasing numbers of boats that mean less space and fewer fish available per boat.¹¹⁰ This fuels the intense competition that is inherent in the fishing industry, resulting in innovation and willingness by fishers to find and use new techniques and equipment if it could bring in a bigger catch.¹¹¹ This also leads them to be willing to bring in a higher variety of species, taking whatever they can find enough of.

Part of this intensity is motivated by the high costs of operating a boat. A crew spends a significant amount of money just going on their trip, and it is essential they recover these costs however they can. Therefore, if their target species such as shark is not present, they search for others.¹¹² Their goals shift from bringing in the most valuable species to bringing in anything they can sell. Since their pay is also directly dependent on the value of their catch, they are motivated to pull in as much as possible trying to balance days spent at sea and what they consider a sufficient income. This pattern of moving on in catch also applies if a species disappears completely. For instance in the 1980's scallops were super abundant in Panamá's waters and many people were making large sums of money off the fishing and sale of scallops. They were so valuable that hoards of people went after them, eventually overfishing them to extinction. Now, there are no scallops to be found in Panamá's waters, the only remnants, huge piles of shells in port towns like Caimito that used to prosper from them.¹¹³ As the scallops disappeared, those who used to depend on them transitioned to other species, but not necessarily without suffering lower incomes as a result.

This reflects a general mindset of flexibility and transition prevalent in the seafood industry. Unlike other consumption markets, demand for fish is highly flexible. While a restaurant may request a certain species, if it is simply not available they are able to adjust their menus without too much trouble to use another species instead. Vendors or middlemen who buy from the boats, process shark and sell it to retailers are

¹⁰⁹ 24H Captain 2005, 18F Captain 2005, 20G Crew 2005

¹¹⁰ 6A Crew 2005, 20G Crew 2005

¹¹¹ Larkin, *Fisheries Management – An Essay for Ecologists*. (1978)

¹¹² 12 Vendor 2005

¹¹³ 9C Captain 2005, 12 Vendor 2005

aware of this and will go to great lengths to find requested species, but are also aware what they can substitute if necessary.¹¹⁴ This creates a problem for conservationists who seek to work with the industry convincing them conservation of sharks is important to maintain sustainable shark populations for fishing for years to come. Many fishers echoed the feeling that if sharks become too difficult to find, they will simply move on to other species.¹¹⁵ The leverage within this flexible system is that sharks are a particularly valuable species economically, and it may be possible to convince fishing groups that this is enough to support conservation so they will continue. Additionally, it would be essential to educate participants in the industry about shark's value beyond the direct economic value of meat and fins. Since most shark fishers also target other species, it is important they understand how sharks help control and maintain these other species through the trophic food web. Realizing this importance of shark to their other catches may help them value shark differently and be more inclined to support conservation initiatives.

Such education is especially important for the many fishers who say there are enough sharks for them and always will be without realizing how much more susceptible sharks are to overfishing than the pelagic species they target.¹¹⁶ This also brings up the question if what fishers consider enough is the same amount that can support a sustainable marine ecosystem. Reconciling this difference is another challenge in conservation because it forces groups to recognize precisely their purpose – is it to maintain fishable populations for economic gain or to maintain marine ecology for the inherent value of nature? Groups need to be exceptionally honest about this and understand the position of everyone involved in the process in order function efficiently and understand what success means to different participants.

Such education campaigns are an essential part of any conservation initiative, but their success depends on if industry participants are even interested and engaged. Many artisanal fishers in particular stay focused on the day ahead of them rather than thinking about the future. They are concerned more with ensuring they make enough money for the present moment than the future of their trade, even when they realize populations are declining and they will likely face problems in the future.¹¹⁷

All of these problems come down to making the industry care about and understand the ecological value of sharks, which is not an easy task, but an essential step to success because if the industry is not engaged, they will resist whatever regulation is proposed. This could mean stalling progress of the newly formed PAN-Tiburón group which seeks for form a new national action plan with cooperation of the industry, halting recommendations to AMP from their position on the Fishing Committee, lobbying against new laws and ultimately if regulations are passed, adapting creative ways of getting around them. One vendor explained that if shark fishing were to be severely limited or stopped, people would still do it using the cover of the open seas to hide their activities.¹¹⁸ Basically, if there is a strong demand that is paying, boats will find ways to supply it. This is why it is important to include retailers and vendors as well in the education and effort of building a conservation plan.

The demand directed market has even bigger challenges when the demand is so far separated from the source, such as meat and fin demand of the United States and high fin demand of Asia. These sources of demand are very far removed from Panamá

¹¹⁴ 12 Vendor 2005

¹¹⁵ 9C Captain 2005

¹¹⁶ 6A Crew 2005, 18F Captain 2005

¹¹⁷ 20G Crew 2005, 6A Crew 2005

¹¹⁸ 12 Vendor 2005

and the effects they are having on the environment or people in the country. One solution is to direct educational campaigns in these foreign markets to help curb the demand. This requires major resources and time in the areas to build a successful and culturally aware campaign. Another is to study the laws and regulations of these countries to try and convince them to participate in the regulation here. For instance, the United States is a major importer of shrimp from Panamá, but requires all shrimp boats in Panamá use the Turtle Excluding Devices. The U.S. sends representatives from the National Oceanic and Atmospheric Administration (NOAA) to Panamá to train inspectors and inspect boats themselves. Panamá just recently came off an embargo from the U.S. when NOAA inspectors found boats without the proper equipment. This prompted the AMP to act quickly and forcefully, and now all boats are in compliance.¹¹⁹ The success of this program could be used a model for ones pertaining to sharks¹²⁰, where for instance, in the U.S. finning is illegal and could request that their shark imports be from boats that do not fin.

Finally, the principle institutional support of the industry from the national government has been through Certificadas de Abonos Tributarios (CAT). These are certificates for companies exporting non-traditional items that act as cash that companies can use to pay taxes or sell for cash to other companies.¹²¹ The certificates are based off a percentage of the sale of the item, and fins have traditionally had a significantly high percentage rate.¹²² When a company files its paperwork to export items, they declare the amount of the item and how much they are selling it for, and then government gives them certificates like cash equivalent to a set percentage that varies per item. The idea of this program was to give extra support to exporting companies to reinvest and expand their business, but often the cash value of the certificates was simply being pocketed by executives rather than put back into the company, although some companies used them as intended and commented that they really helped. These incentives give Panamanian exporters an unfair advantage over other countries, according to the World Trade Organization who have asked the Panamanian government to end the program, which it is doing on December 31, 2005.¹²³ This program only benefited the companies, not the fishers and the end of it will likely only affect the bottom lines of exporting companies, taking away some of their profit. It is possible this could bring down the prices they are willing to pay for fins off the boat, but equally likely that they could increase the price of the final product or not do anything and simply accept a slimmer profit.

Current Conservation Initiatives

The current threatened status of sharks worldwide has caught the attention of international, regional and local Panamanian groups who are acting to curb the demand, regulate finning and assess the true situation of sharks around the world. The U.N. Food and Agricultural Organization (FAO) has made the recommendation to all countries with shark populations that they make a national plan regarding their shark stocks and industry. This has been the only action of the international body, but inspired a group to form in Panamá, the first in the world,¹²⁴ to investigate the issue and

¹¹⁹ 15 AMP Official 2005, 16 AMP Inspector 2005, 19 AMP Inspector 2005

¹²⁰ 12 Vendor 2005

¹²¹ 25 MCI Official 2005

¹²² 12 Vendor 2005

¹²³ 25 MCI Official 2005

¹²⁴ 2 AMP Official 2005

team up with other organizations working on the issue in Central America and throughout the world.¹²⁵

National Action Plan

PAN-Tiburón is a group headed by the Marine Resources Department of the AMP and includes a local non-governmental organization, the National University of Panamá, the National Federation of Artesanal Fishers, the National Maritime Service and the University of Valparaíso, Chile.¹²⁶ To date they have produced a draft National Action Plan that is in the process of being reviewed, but are still yet to meet as a group.¹²⁷

Their goals as stated in their draft plan are to collect information about shark species and sustainable maximum yield and use this to generate methods and strategies of development to optimize the exploitation of shark resources. They put a large emphasis on the study of shark populations in Panamá and seek to research the species, size, sex and level of maturity of sharks brought in at 13 different ports. Eventually, they hope to calculate the maximum sustainable yield for sharks and use this as a guideline for regulating shark fisheries to a level of maximum use for the fishers and sustainability for the ecosystem. They aim to work directly with captains of boats to maintain open dialogue and effective levels of communication and cooperation in order to ensure they take into account the needs of the people in the fishing industry.¹²⁸

While just a draft, the plan appears comprehensive, taking into account environmental and social issues involved and trying to work with all the stakeholders to create an effective and fair plan. Its emphasis on taking scientific inventories and using them to measure quantitatively the current situation and future changes is a solid way to create concrete goals and know when they have been achieved. They seek to study both industrial and artisan fisheries which will give a more realistic sense of the situation and how to deal with it in both realms.

The biggest element the plan lacks thus far is a time-table and action steps. The group to date has not scheduled their first meeting yet, and can not move forward until they do. Their plan is going to take much time and resources to achieve, which will have to be managed carefully and efficiently in order to realize their goals. It appears their biggest challenge will be managing this project while the core people involved are already working full time. To have even one person working full-time specifically with the shark group within AMP would likely be the best catalyst for this project, if they can find the resources to hire someone.

This plan could accomplish the task of understanding how many PMT licenses can be given out while still maintaining sustainable populations of shark, which is a solid solution to potential industrial over fishing. A further step would be to require a special shark license for artisan fishers in addition to their Artesian Permit. This would help track and limit the amounts of shark being fished by these smaller boats, so AMP and PAN-Tiburón would be able to estimate their impacts as well. Because these licenses would mean many artisan fishers would be restricted from shark, a major source of income, it would require sensitivity and compromise with groups about a system for deciding how many to give out, to whom and designing a process of application that is not overly complicated or costly. It would also need to take into account the common by-catch of artisan boats by studying average amounts of true by-catch and making exceptions for sharks up to a certain percentage or weight that can be

¹²⁵ 2 AMP Official 2005

¹²⁶ Ney Castillo, *Pesca Excesiva Amenaza al Tiburón* (La Prensa, 2005)

¹²⁷ 13 NGO Representative 2005

¹²⁸ AMP, *Plan de Acción Nacional de los Tiburones* (2005)

claimed as by-catch and sold. At first these licenses could be widely distributed with the stipulation that they need to be renewed every one to two years and renewal is not guaranteed. Then, in coming years, AMP could gradually decrease the number of licenses offered in order to make it an easier transition away from shark. Because of the flexibility of the market, such licensing and restrictions should not severely limit sources of income for artesian fishers, who will likely feel the weight of new restrictions at first, but adapt their routines accordingly.

A Regional Ban on Finning

Costa Rica was the first Central American country to pass anti-finning legislation this year following four years of work by non-governmental organizations. Now some of the same groups are working on a treaty that would ban finning across all seven Central American Pacific countries. The first step of this has been assessing each country's shark populations and legislation they support. Next, was to meet with lawyers from each country to draft a resolution that would be viable in each country. Now, they are waiting for approval of the document from other major regional entities before they finalize it and take it directly to the governments.¹²⁹

They are hopeful, but expect this to be a long process in every country. In Costa Rica, people in general were much more aware of the topic than in other Central American countries. The treaty is part of a larger conservation effort to protect marine ecosystems in the Marine Corridor that extends from Costa Rica to Ecuador, and is a good answer to the issue of shark species movement between countries. Maintaining the ecosystem is their main priority, and they admittedly do not investigate the social interactions and implications for their conservation plans.¹³⁰

Banning finning can help reduce overall shark exploitation by requiring bodies for all fins brought in. Because the bodies take up more space, it limits the number of total sharks a boat can capture and bring to shore. It is a basic first step to shark conservation and appears as the most practical approach to address the wasteful, yet often lucrative practice of finning. Many other countries around the world, including the United States already have such legislation, meaning there is international support for the initiative, which can help pressure Central American governments into signing on.

A ban of finning in Panamá would be a success for conservationists, but in reality not adequately address the shark industry of the Isthmus. Semi-industrial boats, which bring in the most shark per trip, are only rarely finning as is because they have the capacity to store whole sharks and are able to sell the meat to the domestic and international markets. The enforcement of the law under the current system would likely result in AMP reviewing the captain's weight reports to make sure the percentages of fin weight do not exceed a predetermined reasonable ratio per pound of shark meat. This system, as already discussed allows captains the discretion not to report something that could land them a fine.

Such a law would have more of an impact on small artesian boats that tend to fin their by-caught sharks, particularly dark meat species such as hammerhead. Under the law, they would have to make a choice to bring in the whole shark with fins and sell it all or toss the whole shark back to save space for their potentially better priced target catch such as shrimp. What they decide to do would depend on the rest of their catch from the trip, making it hard to speculate the specific outcomes of this. It would potentially cut down on the small boats going out particularly to fin and force them to

¹²⁹ 13 NGO Representative 2005

¹³⁰ 13 NGO Representative 2005

bring in the meat as well. Although if these boats are already participating in such a practice they likely have a solid system set-up with a buyer that would allow them to continue the practice, docking in unpatrolled areas to avoid inspectors. Therefore this could potentially reduce income to artesian fishers, but likely not significantly.

While a good start, this plan does not address the high demand for shark meat in Panamá, which is already driving the industry to bring in the whole sharks. The biggest advantage of the plan is probably further protection of dark meat shark species such as hammerhead, which are the most likely to be finned by all classes of boat.

International Protections and Demand Side Activism

Wild Aid, a United Kingdom based non-governmental environmental organization, recommends outlawing finning outright worldwide in the high seas and in particular countries with strict enforcement.¹³¹ They are working in the UN to get whale sharks added to the CITES endangered species list, but without success thus far. Additionally, they are working in Taiwan to decrease the demand of the market, so far with some small successes such as when two top airlines in Taiwan decided to stop serving shark fin soup as part of their first class menus.¹³²

Action at the level of the U.N. is important because a resolution there can protect species or populations worldwide with a level of consistency and help bring much needed international attention to shark's threatened situations worldwide. They have the resources and staff to work on this level, which makes it a valuable role for them to take action where other groups are not able to.

The demand-side activism in Taiwan is crucial to decreasing pressures on Pacific shark populations, because as explained previously, as long as there is a demand, fins will be sold regardless of laws against it.

Conclusion

Pacific marine ecology is in trouble, and it's not just sharks whose populations are declining, but all species according to fishers.¹³³ With more boats every year applying increased pressure to Panamá's fisheries there is no respite or recovery in sight for threatened species. Panamá's lack of current legislation and management of their shark fisheries puts the future of Pacific marine ecosystems and the fishing industry that depend on them in jeopardy.

The current PMT law is better than nothing at all, but barely scratches the surface of marine management. It is essential that in the very near future the AMP steps up and implements a plan that gives them authority to monitor and control shark resources. The formation and drafting of a plan through PAN-Tiburón is a start, but must be followed up with a true commitment of resources and a feasible time table to enact its very large goals. Currently, it is simply a draft document, and appears that it will likely take a number of years to get their studies completed and plausible legislation in place. It is crucial that they begin this process soon because it may only be a few years before sharks become scarce in Panamá's national waters.

The urgency of such management is important to the livelihoods of the unknowing or uninterested fishers of the country who undeniably depend greatly on the capture and sale of sharks. The industry, while aware of population declines, is unwilling to manage themselves in a way that would protect the sustainability of these resources. This is largely due to the competitive nature of fishing and the fact that

¹³¹ Watts, *The End of the Line?* (2001).

¹³² Watts, *The End of the Line?* (2001).

¹³³ 6A Crew 2005, 7B Crew 2005, 17E Captain 2005, 20G Crew 2005

Panamá has thousands of individuals fishers all fighting for use of the same resources and market. Because of this, they need a strong outside force to manage for them, which in this case must be the AMP who has the most access and knowledge of the industry.

International and regional agreements will all ultimately end up resting on the enforcement of the AMP, and as they demonstrated with the Turtle Excluding Devices, they are not likely to act on it forcefully enough until it is too late. When outside organizations put added pressure on already resource strapped government agencies it is difficult for them to adjust and effectively follow through. There is also the matter of motivation where if their only oversight is from foreign and far off sources, they are less likely to follow through vigilantly.

Therefore, the management plan and enforcement strategy must be internal to ensure resources are applied to it in an appropriate and plausible manner. Additionally, it is crucial the management plan be coupled with adequate education of the staff, especially those charged with enforcement. One inspector complained that they are not given any education about the ecology or biology of the area or species they are in charge of.¹³⁴ Without this knowledge or understanding there can be a lack of personal motivation for enforcement. Also, such education would act to empower the inspectors who are the personnel interacting with fishers daily to educate the fishers and help them understand why they are subject to regulations. This interaction paired with comprehensive and understandable educational materials directed at fishers could help them understand the purpose of marine management and potentially keep them from finding ways around regulations. PAN-Tiburón's current plan to work closely with captains and artesian groups is another way to help ensure their cooperation and form policy that is effective, but not to their complete detriment.

These factors are why it is management, not just restrictions that are necessary to protect sharks without disrupting the personal incomes of thousands of Panamanians. Currently, there is almost a complete lack of management of artesian fleets, and very little understanding about their actual impacts. There must be a mechanism created to allow some oversight on them before they overexploit their own resources to the detriment of not just themselves but the ecosystem and people who depend on shark and other species for nutrients and protein.

AMP already has the infrastructure in place at many ports with inspectors in the water and at the docks, they just need the power to use these inspectors differently. New regulations about finning could be effective if these inspectors were also charged with overseeing the process of weighing cargo and reporting it themselves. They could also be trained in working with artesian fishers and finding a system to track and report their catches through a special licensing of artesian boats for sharks. Admittedly this would likely require more inspectors and more training time from an already strapped Marine Resources department, but there are creative ways of handling this as well. As the CAT system expires, it frees up large amount of government money that was once going to the exportation of marine products. Some of this money could potentially get rerouted to Marine Resources to now protect these sources. Or Marine Resources could seek funding from outside the national government from AID agencies or foundations for marine conservation.

Something must be done to protect shark populations and it must be done soon and with the cooperation and education of everyone involved. Losing shark species will disrupt the order of all levels of marine life and the people dependant on it. AMP has a

¹³⁴ 19 AMP Inspector 2005

tall order to fill, but also has dedicated and knowledgeable staff within Marine Resources who are capable of accomplishing this if they are empowered to do so.

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