POSITION ON CITES SHARK PROPOSALS

Of the 591 shark and ray species assessed by scientists with the International Union for Conservation of Nature (IUCN), 21 percent are threatened with extinction and 18 percent have a near-threatened status. Just as troubling, researchers lack adequate information on 35 percent of sharks and rays to make accurate population assessments.

The United Nations Food and Agriculture Organisation (FAO) estimates that more than half of highly migratory sharks are either over-exploited or depleted. Shark fishing is driven by the demand for shark fins, used in the delicacy shark fin soup. Approximately 73 million sharks are killed annually to support the international fin trade. Sharks are also caught for their meat and for other products. International trade of this magnitude is problematic, because sharks tend to grow slowly, mature late and produce few young over their lifetimes, leaving them exceptionally vulnerable to over-exploitation. Shark populations are slow to recover from depletion, and removal of these key predators risks the health of entire ocean ecosystems.

Never before have so many shark species—including three of the distinctive hammerheads—been proposed for consideration at CITES. The Pew Environment Group considers that the four shark proposals meet the criteria for inclusion in CITES Appendix II. Such listings will complement and reinforce fisheries management measures, provide much needed data and monitoring of trade and also contribute to implementation of the FAO International Plan of Action for the Conservation and Management of Sharks.

We urge all CITES Parties to support these proposals at CoP15.

Proposal 15: Scalloped hammerhead

Hammerhead shark fins are highly sought after for shark fin soup because of their large size and the high "needle count," or fibers, that make up the fin. Globally distributed, scalloped hammerhead sharks are classified by the IUCN as "Endangered." Four other shark species (smooth hammerhead, great hammerhead, sandbar and dusky sharks) are included in this proposal as look-alike species because their fins are not easily distinguished from scalloped hammerhead fins.

Proposal 16: Oceanic whitetip

This species is noted for its large, rounded fins, usually tipped with white. Oceanic whitetip sharks are threatened by harvest for the international fin trade and as bycatch in commercial fisheries. Oceanic whitetip sharks are listed on the IUCN Red List as "Critically Endangered" in the Northwest and Central Atlantic Ocean and "Vulnerable" globally.

Proposal 17: Porbeagle

Porbeagle meat is considered high quality, particularly in Europe, and fins are also in demand. The porbeagle is listed on the IUCN Red List as "Vulnerable" globally, "Endangered" in the Northwest Atlantic and "Critically Endangered" in the Northeast Atlantic and Mediterranean Sea.

Proposal 18: Spiny dogfish

This species is subject to unsustainable fisheries in several parts of its range because of strong international demand for its meat, primarily from Europe, although dogfish fins also enter international trade. Spiny dogfish are listed on the IUCN Red List as "Vulnerable" on a global basis.

RECOMMENDATION: Support all shark proposals at CITES CoP15, an unprecedented opportunity for action.

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CITES PROPOSAL 15
SCALLOPED HAMMERHEAD SHARK

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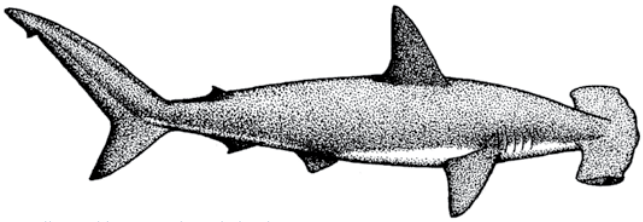
Doug Perrine/SeaPics.com

SCALLOPED HAMMERHEAD *(Sphyrna lewini)*	
Appendix II listing	Proposed by Palau, the United States
IUCN Red List status	**Endangered** globally

RECOMMENDATION: SUPPORT

- The Pew Environment Group applauds the submission of this proposal and urges CITES Parties to support it.
- The expert panel of the United Nations Food and Agriculture Organisation (FAO) has determined that scalloped hammerheads warrant an Appendix II listing.
- Scalloped hammerheads are exploited primarily to satisfy a growing global demand for their fins. Hammerhead fins are among the most valued in trade due to their large size and high "needle count."[1] These needles are composed of fibers, which support the fin and are prized in shark fin soup.[2]
- Little to no management exists for the international trade of scalloped hammerhead products.[3] No regional fisheries management organization oversees take of this species or any of the proposed look-alike species.
- A CITES Appendix II listing for scalloped hammerheads would greatly ensure the future sustainability of wild populations by regulating international trade in hammerhead products.



Scalloped hammerhead shark Alessandro De Maddalena/SeaPics.com

Biological vulnerability to over-exploitation:

- Low reproductive capacity, with average litters of 14 to 26 pups.[4]
- Slow intrinsic population growth in comparison with other species of sharks.[5]
- Long gestation period of eight to 12 months.[6]
- Long reproductive periodicity, reproducing only every two years.[7]

Scalloped hammerhead fisheries and trade

The scalloped hammerhead shark, one of the most distinctive creatures on the planet, is subject to targeted fisheries, illegal fishing and fishery bycatch throughout the world. Catch methods include pelagic longlines and fixed bottom nets, as well as bottom and pelagic trawls. They are exploited for their fins, meat, hide and oil.[8] Fisheries surveys in the Northwest Atlantic have documented declines of up to 98 percent,[9] and landings in the Southwest Atlantic have shown declines of up to 90 percent.[10] Unlike other species of sharks, hammerheads frequently aggregate in large numbers, which makes them more vulnerable to fishing efforts.[11] Furthermore, according to a 2008 assessment of illegal, unreported and unregulated fishing, hammerheads are among the most frequently taken shark species in illegal fishing.[12]

Species-specific trade data are limited, but market-based scientific inquiries have yielded important trade information.[13] Traders have stated that hammerhead fins are some of the most valuable in the market.[14] The three hammerhead species *(Sphyrna lewini, S. mokarran, S. zygaena)* combined make up approximately 6 percent of the identified fins entering the Hong Kong market.[15] From this information, scientists have estimated that 1.3 million to 2.7 million scalloped and smooth hammerheads are exploited for the fin trade every year.[16]

A research study published in 2009 in the journal *Endangered Species Research* documents the global nature of the scalloped hammerhead trade. Researchers performed DNA tests on shark fins obtained from the Hong Kong market and were able to determine their geographic origins. Findings from 62 fins revealed that 21 percent had originated from endangered scalloped hammerhead populations.[17]

Including scalloped hammerheads in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II is justified under the CITES listing criteria (Res. Conf. 9.24 [Rev. CoP14], Annex 2a [A]): Regulating trade of scalloped hammerhead products is necessary to avoid the future eligibility of this species for an Appendix I listing.

Due to the similar appearance of certain species' fins, it is unlikely that enforcement personnel could readily distinguish between scalloped hammerhead fins and dusky and sandbar shark fins once the fins have been removed from the body and entered into trade. Thus, this proposal also offers regulation of the trade of "look-alike species": smooth hammerhead, great hammerhead, sandbar and dusky sharks. (Although individual sandbar and dusky sharks do not resemble hammerheads, their fins are quite comparable when detached.) Inclusion of these species is justified under the CITES listing criteria in Annex 2b (A).

The Pew Environment Group recommends that Parties support this proposal and looks forward to providing assistance and collaboration in its implementation.

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Eric H. Cheng/SeaPics.com

OCEANIC WHITETIP SHARK *(Carcharhinus longimanus)*	
Appendix II listing	Proposed by Palau, the United States
IUCN Red List status	**Critically Endangered** in Northwest and Central Atlantic Ocean **Vulnerable** globally

RECOMMENDATION: SUPPORT

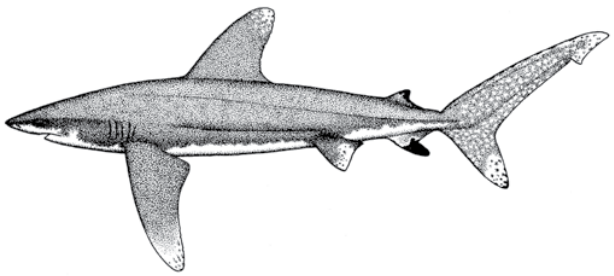
- The Pew Environment Group applauds the submission of this proposal and urges CITES Parties to support it.
- The expert panel of the United Nations Food and Agriculture Organisation (FAO) supports this listing and has declared that Proposal 16, to include the oceanic whitetip in Appendix II, is corroborated by scientific data and sufficiently meets the listing criteria.
- Oceanic whitetip sharks have experienced significant population declines in the Northwest Atlantic and the West-Central Atlantic due largely to over-exploitation fueled by a global demand for their large, high-value fins.[1]
- Despite declines, there is little to no management of trade in this species, and the scope of illegal trade is unknown.[2]
- A CITES Appendix II listing would regulate international trade in oceanic whitetip shark fins, spurring steps to sustainably manage this species.

Biological vulnerability to over-exploitation

- Long gestation period of nine to 12 months.[3]
- Low to moderate population growth rates, in comparison with other shark species.[4]
- Long reproductive periodicity, reproducing every two years.[5]
- Low reproductive capacity, with only five to six pups per litter.[6]

Oceanic whitetip fisheries and trade

The oceanic whitetip is one of the most widespread shark species and is found in all of the world's oceans.[7] Several targeted fisheries exist for oceanic whitetips, and they are frequently caught as bycatch in tuna and swordfish fisheries.[8] Although this species experiences a high catch-survival rate on longline fishing equipment, the low market value of its meat coupled with the high value and increasing demand for its fins encourages the practice of finning.[9] Fins of this species have been valued at US$45 to $85 per kilogram.[10] Thus, rather than releasing live catch or utilizing the entire shark, fishermen often remove the fins at sea and dispose of the carcass overboard. Oceanic whitetip fins are easily identifiable in trade by their white coloring, rounded shape and large size.



Oceanic whitetip shark

Alessandro De Maddalena/SeaPics.com

The size of oceanic whitetip populations is difficult to estimate, because stock assessments have not been conducted and data are generally limited.[11] However, U.S. pelagic longline surveys and observer data in the Gulf of Mexico have estimated a decline of 99 percent over four generations for this species.[12] In the Northwest Atlantic, an analysis of U.S. pelagic longline logbook data estimated declines of up to 70 percent.[13] A similar analysis of pelagic longline surveys and observer data from the Pacific yielded a 90 percent decline in biomass.[14]

Although the United Nations lists the oceanic whitetip as a highly migratory species, little progress has been made in the adoption of international conservation measures, and international catch is inadequately monitored.[15] The Pew Environment Group recommends that Parties support this proposal and looks forward to providing assistance and collaboration in its implementation.

Including oceanic whitetips in Appendix II is:

- Consistent with Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listing criteria (Res. Conf. 9.24 [Rev. CoP14], Annex 2a[A]); regulating trade is necessary to avoid the future eligibility of this species for an Appendix I listing.
- Necessary to ensure that international trade is regulated sustainably.
- Likely to spark enhanced assessment and management of populations worldwide as countries will need to make non-detriment findings before issuing permits for international trade.
- Necessary to end the serial population depletion driven by international trade.
- In line with the FAO International Plan of Action for sharks.

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Doug Perrine/SeaPics.com

PORBEAGLE SHARK *(Lamna nasus)*	
Appendix II listing	Proposed by Sweden on behalf of European Union Member States and Palau
IUCN Red List status	**Critically Endangered** in Northeast Atlantic and Mediterranean **Endangered** in Northwest Atlantic **Near Threatened** in Southern Ocean **Vulnerable** globally

RECOMMENDATION: SUPPORT

- The Pew Environment Group applauds the submission of this proposal and urges CITES Parties to support it.
- The expert panel of the United Nations Food and Agriculture Organisation (FAO) acknowledged significant porbeagle population declines and determined that available data support the proposal to include *Lamna nasus* in CITES Appendix II.
- Porbeagle sharks are very slow growing with low reproductive capacity. Yet, they are over-exploited in bycatch and targeted fisheries for their large fins and high-value meat.[1]
- To date, governing bodies have enforced little to no international trade limitations of porbeagle shark products.[2]
- A CITES Appendix II listing would regulate international trade of porbeagle meat and fins, aiding efforts to reverse the unsustainable harvest of this species.
- Although the European Union's recent decision to end all fishing for porbeagles in the Northeast Atlantic, where the species is critically endangered, will help the species recover, the regional action does not alleviate the need for the international protections that a CITES listing provides.

Biological vulnerability to over-exploitation

- Long gestation period of eight to nine months.[3]
- Long-lived:
  - 29 to 45 years, Northwest Atlantic
  - about 65 years, Southwest Pacific[4]
- Slow to reach reproductive maturity:
  - 18 years, Northwest Atlantic
  - 26 years, Southwest Pacific[5]
- Low reproductive capacity, with litters averaging about four pups.[6]

Porbeagle fisheries and trade

The porbeagle shark is a large shark distributed throughout the temperate North Atlantic and Southern oceans. This species yields significant commercial value for its large fins and meat, and is taken in both targeted and bycatch fisheries. The combination of the porbeagle's low reproductive output and high market value makes populations especially vulnerable to over-exploitation and depletion.[7] Porbeagle sharks have been heavily exploited in the Northwest and Northeast Atlantic. In the Northwest Atlantic, female spawning stock has decreased to between 12 and 16 percent of former levels.[8] Populations are so depleted that the Canadian Department of Fisheries and Oceans (DFO) has determined that porbeagles are no longer fulfilling their role in the ecosystem.[9]

Scientific analysis of stock assessment data in the Northeast Atlantic revealed severe population declines, estimating more than a 90 percent depletion of biomass from baseline levels.[10] Over the past several

Porbeagle shark

Alessandro De Maddalena/SeaPics.com

years, scientists with various entities, including the International Council for the Exploration of the Sea (ICES), have encouraged the closure of Northeast Atlantic porbeagle fisheries. Additionally, scientists have supported practices that limit bycatch and eliminate landings of this critically endangered population.[11]

Stock information is less available for Southwest Atlantic porbeagles, but depletion in spawning stock indicates biomass is 18 percent of previous levels.[12] In the Mediterranean Sea, porbeagles have virtually disappeared from fishery record.[13] Bycatch research on Mediterranean pelagic fisheries in 1998 yielded only 15 specimens in 12 months.[14] Additionally, research on swordfish longline bycatch published in 2002 documented zero catch of *Lamna nasus* in the Western Mediterranean.[15] On the high seas, porbeagle catch numbers are unclear because of widespread underreporting.[16]

The absence of species-specific trade data has hampered efforts to determine the proportion of global catch that enters international trade. At the conclusion of International Commission for the Conservation of Atlantic Tunas (ICCAT)/ICES specialist meetings in 2009, officials recommended that high-seas fisheries stop targeting porbeagle.[17] In 2007, Germany proposed a Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II listing for *L. nasus* at the 14th Conference of the Parties. However, the proposal did not achieve the two-thirds majority vote required for an Appendix II listing and was defeated. The CITES meeting in March 2010 presents the opportunity to secure a CITES listing for porbeagle and to enact crucial trade regulations that will help to ensure the future sustainability of this highly vulnerable species. The Pew Environment Group recommends that Parties support this proposal and looks forward to providing assistance and collaboration in its implementation.

Including porbeagle sharks in CITES Appendix II is:

- Consistent with the CITES listing criteria (Res. Conf. 9.24 [Rev. CoP14], Annex 2a [A, B]), Annex 2b (A).
- Essential for ensuring that international trade is regulated sustainably.
- Likely to spark enhanced assessment and management of populations worldwide because countries will need to make non-detriment findings prior to issuing permits for international trade.
- Necessary for ending the serial population depletion driven by international trade.
- In line with the FAO International Plan of Action for sharks.

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Andy Murch/SeaPics.com

SPINY DOGFISH SHARK *(Squalus acanthias)*	
Appendix II listing	Proposed by Sweden on behalf of European Union Member States and Palau
IUCN Red List status	**Critically Endangered** in Northeast Atlantic **Endangered** in Northwest Atlantic **Vulnerable** globally

RECOMMENDATION: SUPPORT

- The Pew Environment Group applauds the submission of this proposal and urges CITES Parties to support it.
- Spiny dogfish are in the U.N. Food and Agriculture Organisation's lowest productivity category and are extremely vulnerable to over-exploitation because of their slowness to reach reproductive maturity, lengthy gestation and small litters.[1]
- A strong international demand for spiny dogfish meat and other products has fueled unsustainable harvest of this vulnerable species.
- Fisheries records and stock assessment information have revealed steep declines in reproductive biomass of spiny dogfish around the globe.
- A CITES Appendix II listing would greatly improve the future sustainability of wild populations by assisting in the regulation of international trade in spiny dogfish products.
- Although the European Union's recent decision to end all fishing for spiny dogfish in the Northeast Atlantic, where the species is critically endangered, will help the species recover, the regional action does not alleviate the need for the international protections that a CITES listing provides.

Biological vulnerability to over-exploitation

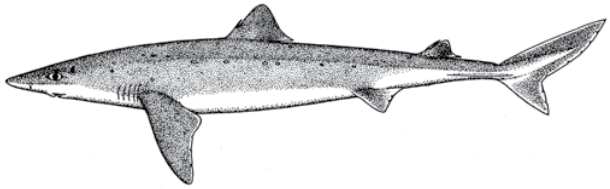
- Slow to reach maturity:
  Females:
  - 6 years, Northwest Atlantic
  - 15 years, Northeast Atlantic
  - 23 to 32 years, Northeast Pacific

  Males:
  - 10 years, Northwest Atlantic
  - 14 years, Northeast Pacific[2]
- Low reproductive capacity, with only one to 20 pups per litter.[3]
- Long lives; some stocks are thought to have individuals that live up to 100 years.[4]
- Very long gestation period of 18 to 22 months.[5]

Spiny dogfish fisheries and trade

The spiny dogfish is a high-value commercial species experiencing over-exploitation in target and bycatch fisheries. The fish are caught in bottom trawls, gillnets and line gear, and by rod and reel. Exploitation is fueled primarily by strong international demand for its meat, often sold as rock salmon, rock eel or flake. The European Union is a major importer of the meat, although fins and other spiny dogfish products are traded internationally as well.[6] This species is among the slowest growing, latest maturing and least productive of all sharks.[7]

These characteristics, in combination with a low intrinsic rate of population increase, make spiny dogfish highly susceptible to fisheries and slow to rebound from population depletion.



Spiny dogfish shark

Alessandro De Maddalena/SeaPics.com

Females have a tendency to form large aggregations, which are frequently exploited by commercial fisheries. Female spawning stock in the Northwest Atlantic declined 75 percent between 1988 and 2005.[8] Large females are highly valued in trade and frequently sought in fisheries, yet scientists report that larger females give birth to bigger litters of larger pups with higher survival rates.[9] Scientific studies have revealed that larger females carry an average of four times more embryos than smaller females.[10] Removing these females from the wild may have devastating effects on the recovery potential of exploited stocks.

Spiny dogfish declines are documented not just in the Northwest Atlantic, but also throughout most of its range. In the Northeast Atlantic, fisheries stock assessments estimate a 95 percent decline in biomass since 1905.[11] According to the Fisheries Agency of Japan, the current stock level in the Northeast Pacific is extremely low,[12] and landings have declined by more than 90 percent. In the Northwest Pacific, the landings have fallen 99 percent.[13] Stock assessments in the Black Sea revealed declines of more than 60 percent from 1981 to 1992.[14]

In 2007, Germany proposed a Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II listing for *Squalus acanthias* at the 14th Conference of the Parties.

However, the proposal was defeated with 57 votes in favor, 36 against and 10 abstentions, short of the needed two-thirds majority.[15] In turn, no bilateral or international management measures are in place outside of catch limit agreements between Norway and the European Union. The March 2010 CITES meeting presents the opportunity to secure a listing for spiny dogfish and to enact crucial trade regulations that would help to ensure the future sustainability of this highly vulnerable species. The Pew Environment Group recommends that Parties support this proposal and looks forward to providing assistance and collaboration in its implementation.

Including spiny dogfish in CITES Appendix II is:

- Consistent with the CITES listing criteria (Res. Conf. 9.24 [Rev. CoP14], Annex 2a [A, B], Annex, 2b [A]).
- Necessary to ensure that international trade is regulated sustainably.
- Likely to spark enhanced assessment and management of populations worldwide as countries will need to make non-detriment findings before issuing permits for international trade.
- Important for reinforcing existing fisheries management.
- In line with the FAO International Plan of Action for sharks.

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Shark fins and other body parts in trade can be identified to the species level

MARCH 2010

Genetic Identification of Shark Body Parts in Trade: Rapid, Reliable, Inexpensive

A Summary of a New Scientific Analysis

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Four proposals to restrict the trade of shark products will be under consideration by the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) at their meeting in March in Doha, Qatar. If these proposals are successful, a number of shark species would be listed in CITES Appendix II, a designation that would require export permits or certificates before international trade would be allowed. To assist Parties in their decision-making, this document explains how shark fins and other body parts in trade can be identified to the species level, aiding in enforceability.

Identification of seafood products by DNA barcoding is increasingly common

TABLE 1: VERIFIED CHINESE MARKET CATEGORIES,
literature source for species-diagnostic PCR and reference DNA barcodes* for seven shark species proposed for CITES listing.

Species	Chinese Trade Name	Species-Diagnostic PCR	Reference DNA Barcode
Great hammerhead *(Sphyrna mokarran)*	Gu Pian[2]	Abercrombie *et al.*, 2005	Accession # FJ519473, 1 of 40
Smooth hammerhead *(S. zygaena)*	Gui Chun[2]	Abercrombie *et al.*, 2005	Accession # FJ519539, 1 of 28
Scalloped hammerhead *(S. lewini)*	Bai Chun[2]	Abercrombie *et al.*, 2005	Accession # FJ519453, 1 of 114
S. lewini/S. zygaena	Chun Chi[2]	Abercrombie *et al.*, 2005	*(See Scalloped hammerhead above)*
Dusky shark *(Carcharhinus obscurus)*	Hai Hu[1]	Shivji *et al.*, 2002**	Accession # FJ519136, 1 of 28
Sandbar shark *(C. plumbeus)*	Bai Qing[1]	Pank *et al.*, 2001**	Accession # FJ519623, 1 of 14
Oceanic whitetip shark *(C. longimanus)*	Liu Qiu[1]	Shivji *et al.*, 2002**	Accession # FJ519620, 1 of 20
Porbeagle shark *(Lamna nasus)*	Hei Sha[1]	Shivji *et al.*, 2002	Accession # FJ519727, 1 of 81

* Available at GenBank: www.ncbi.nlm.nih.gov.
** Test developed but validated only in a specific region (additional development is necessary).

Detached shark fins can be identified to species or group

Chinese fin traders sort shark fins under specific trade names based on how the fin looks.[1] The reason is that each type has a specific economic value.[1] For shark species with valuable fins, including most of those proposed for listing at the CITES Conference of the Parties, there is strong association with specific trade names[1] (see Table 1). Thus, potential monitoring approaches for the shark fin trade could include:

- Mandatory labeling of fins by their Chinese trade names early in the supply chain.
- Training and/or equipping inspectors to visually identify the fins of listed species. As discussed below, genetic techniques could then be used to verify or refute the visual identification of fins suspected to originate from listed species that lack the appropriate CITES permit.

Genetics can be used to reliably identify shark body parts

These parts (fins and meat, for example) have been identified using many genetic techniques,[2–6] most commonly through DNA barcoding and species-diagnostic PCR (polymerase chain reaction).

- DNA barcoding involves comparing part of the DNA from an organism of unknown origin (e.g., using a sample from a shark fin or filet) to DNA from a known population or species using a reference library of genetic sequences,[4, 5] which are available on the Internet (see Table 1).
- Species-diagnostic PCR is a standard procedure used to "amplify"—make many copies of—a targeted part of the genome using synthetic bits of DNA, known as primers. Species-diagnostic PCR uses custom-designed primers that match only the species of interest and therefore amplify that species alone, generating a species-specific-size

DNA fragment. Species identification is then possible using the simple and well-established technique of gel electrophoresis, which separates these DNA fragments. Many primers can be combined in one PCR, permitting simultaneous testing for more than one species.[2, 3]

Genetic techniques are available for all proposed species

DNA-barcodes for all proposed species are available in searchable internet databases (e.g., GenBank: www.ncbi.nlm.nih.gov), allowing identification of these species using DNA-barcoding methods (Table 1). Species-diagnostic PCR assays have been published in the primary scientific literature for all three hammerhead shark species—scalloped hammerhead[2] *(Sphyrna lewini),* smooth hammerhead[2] *(S. zygaena),* great hammerhead[2] *(S. mokarran)*—and porbeagle sharks *(Lamna nasus).*[3] These assays have been shown to work for populations of these species around the globe. Tests for the remaining proposed species are in the late stages of development.[3, 6] In addition, the geographic origin of some proposed species can be assessed using publicly available DNA sequences.[7]

Methods require only a basic laboratory set-up and are relatively inexpensive (materials cost US$5 to $10 per sample)

The identification of seafood products by DNA barcoding is increasingly common. DNA sequencing facilities are found in many laboratories around the world and sequencing costs are declining.[4] Many countries now have such facilities at academic and research institutions. Species-diagnostic PCR is even easier and more cost-effective than DNA barcoding because virtually all molecular laboratories in the world are equipped for this relatively simple technique.[2–3, 6] In most of these labs, identification of about 50 shark samples can be completed in a single workday by one technician using species-diagnostic PCR. Additional investment in equipment and automation can further speed analyses.

Genetic testing of shark body parts is being conducted around the world

Molecular approaches for identifying shark species have been developed or applied in East Asia,[1] North America,[2, 6] South America[5] and Oceania,[4] in many cases providing useful information on the fin trade and law enforcement.

Identification of about 50 shark samples can be completed in a single work-day by one technician

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