CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Twelfth meeting of the Conference of the Parties
Santiago (Chile), 3-15 November 2002

These documents are being distributed at the request of India and the Philippines.

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PROPOSAL FROM INDIA AND THE PHILIPPINES (PROP. 35)

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***RHINCODON TYPUS* SMITH, 1828. Whale shark.**

Position paper in support of CITES Proposal 12.35.

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See revised *FAO Catalog of World Sharks* (by L.J.V. Compagno, 2001) for details of whale shark biology and human impact.

Basic problems for the whale shark include:

- **Low numbers**. There is evidence of relatively low numbers of whale sharks locally and presumably worldwide, from spotting and counting at whale shark observation sites and aerial surveys in limited areas.

- **Biological limits**. There is evidence that whale sharks have exceptionally great longevity, low reproductive potential, and long maturation times, which raises the question of whether they should be fished at all and suggests that ecotouristic viewing needs to be conducted with great caution.

- **Behavior and habitat.** There is evidence that whale sharks are *a priori* vulnerable by their behavior and habitat. Whale sharks are highly migratory, may form a single population as indicated by genetic studies, often frequent the surface, are very big (the world's largest fish) and obvious, are relatively slow swimmers, often travel in coastal areas and visit specific reef sites on coasts and off islands to feed and possibly breed, and are relatively easy to catch and kill using a variety of fishing gear and relatively small fishing boats.

- **Bycatch and incidental human impacts.** There is evidence that whale sharks are vulnerable to bycatch fisheries and other human factors past and present, with unknown mortality from ramming by ships and from large drift gillnets and possibly purse seines and longlines worldwide as well as fish traps in certain localities (eg. Philippines). In the last decade whale shark bycatch became highly valuable, and live whale sharks that were previously released from fish traps in the Philippines were killed and processed.

- **Targeted fisheries.** There is evidence that whale sharks are extremely vulnerable to targeted fisheries, starting with small traditional and opportunistic artesianal fisheries for local consumption in several countries but expanding dramatically in the last decade with new targeted fisheries (eg. India, Philippines) supplying international markets for high-value products such as fins and meat.

- **High value.** There is evidence that whale sharks are vulnerable by having extremely high value specifically as whale sharks: A single whale shark can yield tens of thousands of USA dollars worth of products, including meat, fins, skin, and gill rakers. The whale shark is not dissimilar in its product-value problems to other large animals including rhinos, elephants, basking sharks, and white sharks (high prices for jaws, teeth and fins).

- **Ecotourism.** There is evidence that whale sharks are vulnerable by being Increasingly popular for ecotourism and film-making at several viewing sites worldwide, which depends on a steady supply of live whale sharks. Such activities have been found to require strict management to avoid disturbing the sharks. However, such non-destructive utilization of whale sharks is analogous to viewing of large mammals in game parks in that it requires elaborate and rigorous management but generates high value to countries where it is conducted. Whale-shark watching is potentially of greater value than fishing whale sharks for luxury food products.

- **Declining numbers**. Evidence of declines of whale shark numbers in targeted fisheries over the past decade, as well as decreases noted from aerial surveys (eg., South Africa).

Recommendations:

The whale shark, from biological, ecological and human impact data, is an unabundant, highly valuable, highly mobile, extremely large animal under pressure from targeted and bycatch fisheries and has declined in numbers locally and possibly over larger parts of its range. The whale shark has been on the IUCN Red List for nearly a decade, and is protected or about to be protected in several countries. In the writer's estimation, the whale shark needs protection from international trade. Because it is extremely large, with the largest individuals far exceeding the largest elephants in weight and being larger than most cetaceans, is unabundant , and has a high value both dead and alive, several approaches are desirable, including :

- **National protection.** Although whale shark protection under voluntary national plans of action for managing sharks modeled on FAO guidelines would help, the process of implementation is very slow and tends to be oriented towards fisheries management (which is essentially pro-exploitation and pro-development) of fisheries species (as with FAO's mandate as a food-development organization). There are major problems with compiling national plans of action for all sharks in many states, much less implementing them. It is apparently far easier for nations to implement special protection for problem species such as whale sharks, white sharks, and basking sharks than to rationally manage all of their sharks. Certain whale shark range states have already protected this species from fisheries and are managing whale shark ecotourism or substituting it for fisheries, and others are about to follow. Although rational management of all sharks in all shark states is ultimately desirable and the aim of the FAO international plan of action, it is utopian with the present conditions of economics and politics to expect such plans in a few years for all subscribing states. It is possible that many of the shark states may not be able to implement effective national plans of action, in short term or ever. Also, FAO-based plans of action are voluntary, with possibly no effective means of enforcement. A limit to any national plans of action or specific whale-shark protection measures is the highly migratory nature of this shark. Hence other international measures may be more useful for short-term solutions with vulnerable sharks such as the whale shark.

- **Protection by regional pelagic fisheries authorities.** These have a role to play in managing sharks in general and whale sharks in particular but are focussed on far more valuable fisheries for much more abundant teleosts. Again the approach is pro-exploitation and fisheries-driven. As with national plans of action and national protection, the participation of regional fisheries authorities in whale shark management is desirable but of limited utility, in part because whale sharks are limited bycatch of the primarily teleost fisheries that power these authorities.

- **Protection by international conventions to protect biodiversity, including CITES**. Although CITES listing to control or eliminate international trade in endangered species does bring on implementation problems for some species, it does have political clout and high impact with national, regional and world authorities and media organizations, which causes problems for some whale shark range states that are presumably concerned with maintaining fisheries as usual and banning sharks from CITES. The writer favors CITES I over CITES II listing for the whale shark as a protective measure along with certain other large sharks with conservation problems, including the basking shark, white shark, giant manta, and the sawfishes (Family Pristidae). He also suggests that CITES and other international conventions, international and regional fisheries authorities, and national plans and protective measures all can play a positive role with the whale shark and complement, rather than replace, one another. CITES listing, of course, does not protect listed species from black-market exploitation, and even gigantic species such as elephants and whale sharks can be exploited through poaching if the value of their products is sufficiently great.

MORE VALUABLE ALIVE THAN DEAD

THE IMPORTANCE OF WHALE SHARK ECOTOURISM TO THE PHILIPPINES

DOCUMENT SUBMITTED BY MUNICIPALITY OF DONSOL, PHILIPPINES IN SUPPORT OF CITES APPENDIX II LISTING OF THE WHALE SHARKS

Republic of the Philippines
MUNICIPALITY OF DONSOL
Sorsogon

SANGGUNIANG BAYAN

EXCERPT FROM THE MINUTES OF THE REGULAR SESSION OF THE SANGGUNIANG BAYAN MUNICIPALITY OF DONSOL, PROVINCE OF SORSOGON HELD AT ITS SESSION HALL ON OCTOBER 28, 2002

PRESENT:	Hon. Salve R. Ocaya	- Presiding Officer
	Hon. Antonio R. Merciales	- Councilor
	Hon. Nicolas A. Nato	- Councilor
	Hon. Vicente B. Bonaobra	- Councilor
	Hon. Lailany C. Peralta	- Councilor
	Hon. Alejandro L. Rico	- Councilor
	Hon. Armando C. Abitria	- Councilor
	Hon. Jerome P. Alcantara II	- SK President
ABSENT:	Hon. Argel V. Hernandez	- Councilor
	Hon. Zaldy A. Advincula	- Councilor
	Hon. Oro C. Mirahuena	- ABC President

RESOLUTION NO. 151, S-2002

RESOLUTION STRONGLY SUPPORTING THE PROPOSAL OF THE BUREAU OF FISHERIES AND AQUATIC RESOURCES (BFAR) OF THE REPUBLIC OF THE PHILIPPINES FOR THE INCLUSION OF WHALESHARK (RHINCODON TYPUS) IN THE APPENDIX II LISTING OF CITES

WHEREAS, Donsol has been unreputably acclaimed as the Whaleshark capital of the world thereby bringing local pride and bringing concomitant economic, commercial, social and cultural development to the local populace;

WHEREAS, the Local Government of Donsol takes full cognizance of enacted laws particularly in the Philippines to legally protect these endangered and rare species hence, supports whale shark ecotourism programme;

WHEREAS, the Local Government of Donsol accordingly believes that the inclusion of whaleshark in the Appendix II listing of CITES will further strengthen international protection, and encourage international cooperation for effective management and trade monitoring of populations of whalesharks to ensure that these gentle giants are not exploited and international trade for these species will not injure its survival.

WHEREFORE, on motion of Councilor Lailany C. Peralta, seconded by Councilor Antonio R. Merciales, be it -

RESOLVED, as it is hereby DONE to strongly support the proposal of the Bureau of Fisheries and Aquatic Resources (BFAR) of the Republic of the Philippines for the inclusion of whaleshark (Rhincodon Typus) in the Appendix II listing of CITES.

RESOLVED FURTHER that copy of this resolution be forwarded to the CITES Management Authority of the Republic of the Philippines.

APPROVED.

I HEREBY CERTIFY TO THE CORRECTNESS OF THE FOREGOING.

SALVE R. OCAYA
Presiding Officer

ATTESTED: FELIZARDO M. PERALTA
SB Secretary

APPROVED: JEROME P. ALCANTARA

(CLEARER COPY)

Republic of the Philippines

MUNICIPALITY OF DONSOL
Sorsogon

SANGGUNIANG BAYAN

EXCERPT FROM THE MINUTES OF THE REGULAR SESSION OF THE SANGGUNIANG BAYAN MUNICIPALITY OF DONSOL, PROVINCE OF SORSOGON HELD AT ITS SESSION HALL ON OCTOBER 28, 2002

PRESENT:	Hon. Salve R. Ocaya	- Presiding Officer
	Hon. Antonio R. Merciales	- Councilor
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	Hon. Iailany C. Poralta	- Councilor
	Hon. Alejandro L. Rico	- Councilor
	Hon. Armando C. Abitria	- Councilor
	Hon. Jerome R. Alcantara II	- SK President
Absent:	Hon. Argol P. Hernandez	- Councilor
	Hon. Zaldy A. Advincula	- Councilor
	Hon. Oro C. Mirahueno	- ABC President

RESOLUTION NO. 151, S-2002

RESOLUTION IS STRONGLY SUPPORTING THE PROPOSAL OF THE BUREAU OF FISHERIES AND AQUATIC RESOUCES (BFAR) OF THE REPUBLIC OF THE PHILIPPINES FOR THE INCLUSION OF WHALESHARK (RHINCODON TYPUS) IN THE APPENDIX II LISTING OF CITES

WHEREAS, Donsol has been unreputedly acclaimed as the Whaleshark capital of the world thereby bringing local pride and bringing concomitant economic, commercial, social and cultural, social and cultural development to the local populace;

WHEREAS, the Local Government of Donsol accordingly b elieves that the inclusion of whale shark in the Appendix II listing of CITES will further strengthen international protection, and encourage international cooperation for effective management and trade monitoring of populations of whalesharks to ensure that these gentle giants are not exploited and international trade for these species will not injure its survival,

THEREFORE, on motion of Councilor Lailany C. Poralta, seconded by Councilor Antonio R. Merciales, be it –

RESOLVED, as it is hereby DONE to strongly support the proposal of the Bureau of Fisheries and Aquatic Resouces (BFAR) of the Republic of the Philippines for the inclusion of whale shark (Rhincodon typus) in the Appendix II listing of CITES.

RESOLVED FURTHER that copy of this resolution be forwarded to the CITES Management Authority of the Republic of the Philippines.

Approved.
I HEREBY CERTIFY TO THE CORRECTNESS OF THE FOREGOING.

ATTESTED:
FELIZARDO M. PERALTA
SB Secretary

SALVE OCAYA
Presiding Officer

APPROVED:
JEROME F. ALCANTARA
MAYOR OF DONSOL

Molecular identification of tissues from the whale shark, *Rhincodon typus*

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The Galeomorph sharks have been the focus of numerous molecular systematic studies, providing a powerful database for DNA sequence comparisons within and between species (Martin et al., 1992; Martin 1993; Martin and Palumbi, 1993; Dunn and Morrisey, 1995; Kitamura et al., 1996, Naylor et al., 1997; Rasmussen and Arnason, 1999, Winchell et al., 2001). The relatively slow mutation rate of sharks (Martin et al., 1992) causes mitochondrial DNA markers to be virtually free of mutational saturation and lacking in high levels of intraspecific variation. This pattern of mutation can be problematic for the use of some mitochondrial markers in the analysis of sub-population structuring but it provides a powerful tool for between species comparisons. In order to confidently use a molecular marker as a tool for species identification, the amount of intraspecific sequence variation must be estimated and this intraspecific variation must be small in comparison to the level of variation between species. This is exactly the pattern of variation that is observed in mitochondrial markers, such as cytochrome b, and accounts for the common use of these markers in phylogenetic studies.

A comparison of mitochondrial cytochrome b sequence divergence in tissue samples from eight whale shark specimens (table I) from three geographically distinct locations, in two separate ocean basins, revealed less than 0.5% sequence divergence (O'Mullan and Antoniou, unpublished data). This low level of intraspecific variation is consistent with other shark studies (Martin and Palumbi, 1993; Naylor et al., 1997). The level of sequence divergence was greater than 13% in all comparisons to sequences of other galeomorph species including another representative of the Orectolobiforms, the nurse shark (table II). This pattern of low intraspecific variation in comparison to variation between species is consistent with the taxonomic placement of the whale shark as the only species in the family Rhincondontidae (Compagno, 2001).

This molecular information can be used to confidently identify whale shark tissues in a manner similar to the approach used by Baker and Palumbi (1994), where cetaceans were identified from a Japanese fish market. The method is being further developed to facilitate a rapid molecular identification of whale shark tissues and to alleviate the need for access to DNA sequencing facilities (O'Mullan and Antoniou, in prep). The technique described in this paper can be utilized for any tissue or fluid sample from which DNA can be extracted, for example the samples in this study were not fresh tissues but instead ethanol preserved tissues. These preliminary findings are also encouraging for the prospects of expanding current molecular fingerprinting techniques for shark conservation (Shivaji et al., 2002) to include identification of whale shark tissues. This data displays the capability of molecular techniques to confidently identify whale shark tissues and provides a starting point for the development of less labor and resource intensive identification procedures.

O'Mullan and Antoniou 2002

Table I: whale shark samples collected by the Shark Research Institute and analyzed for this study.

# specimens	Location	Gene amplified
6	Honduras – eastern coast	Cytochrome b
1	Galapagos	Cytochrome b
1	Sea of Cortez	Cytochrome b

Table II: Cytochrome b (694 bp fragment) percent sequence divergence in comparison to Honduras cyt b consensus sequence. An additional 17 species of galeomorph sharks were compared to the whale shark and had a sequence divergence >13% (data not shown). Non-Orectolobiform cyt b sequences were downloaded from genbank (accession numbers provided) and do not represent the work of either author.

Species of Comparison sequences	% sequence divergence	Order of Comparison sequence	Genbank number of comparison for sequence
Variation within 8 sequenced whale sharks	<0.5% (intraspecific)	Orectolobiformes	O'Mullan unpublished
Whale shark/ Ginglymostoma cirratum Nurse shark	13.4% (interspecific)	Orectolobiformes	O'Mullan unpublished
Whale shark/ Carcharodon carcharias White shark	23.2% (interspecific)	Lamniformes	L08031
Whale shark/ Galeocerdo cuvier Tiger shark	20.4% (interspecific)	Carcharhiniformes	L08034
Whale shark/ Heterodontus francisci Horn shark	21.3% (interspecific)	Heterodontiformes	AJ310141

Brief methods:

DNA was extracted, precipitated and rehydrated as described in Maas et al., (1999) from approximately 5 mg of whale shark and nurse shark tissue samples. An approximately 1100+ bp fragment of cytochrome b was amplified and sequenced using the primers GluDG-L14724, CB4aL-15040, CB3H-15560, and CB6ThrH-15930 (Martin and Palumbi, 1993). The 50µl amplification reaction contained 1µl template DNA, 2.5mM $MgCl_2$, 20µM dNTP (5µM each nucleotide), 0.4µM of each primer, 1 unit *Taq* polymerase and 5 µl 10x buffer (Promega, Madison, WI). The PCR profile (95°C/60s, 52°C/90s, 72°C/60s) continued for 35 cycles. Negative controls were included with every round of amplification. Sequencing reactions using BigDye terminators (Perkin Elmer) were analyzed on a Perkin-Elmer ABI 373 or 310 DNA sequencer. Sequences were aligned and edited in Auto Assembler (v.1.4.0, Applied Biosystems) and Sequence Navigator (v.1.0.1, Applied Biosystems). Pairwise distances were calculated in Paup (version 4.0b10).

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Compagno, L.J.V. 2001. FAO Species Catalogue. Vol. 2, Sharks of the World. An annotated and illustrated catalogue of shark species known to date. FAO Species Catalogue for Fisheries Purposes No. 1 vol. 4: 203-209.

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Rasmussen, A.S., and U. Arnason. 1999. Proceedings of the National Academy of Sciences of the United States of America 95: 2177-2182.

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STATEMENT IN SUPPORT OF CITES PROPOSAL 12.35 (APPENDIX II LISTING FOR WHALE SHARKS)

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An essential component of any proposal to monitor and/or regulate trade in whale shark products is the ability to identify such products and distinguish them from those of other shark species. Molecular technologies exist to allow the generation of a DNA-based assay for the species-specific identification of even highly processed shark products. Such methodologies have been developed to identify specifically products from the basking shark (Reference 1) from three different shark species, and to distinguish between six different shark species (Reference 2). DNA identification to distinguish between shark species is based upon use of the polymerase chain reaction (PCR) amplification of shark DNA using oligonucleotide primers directed at both conserved and variable DNA sequences of both the nuclear and mitochondrial genomes.

Conserved primers are common across all shark species, and serve as controls for the presence of shark DNA and the quality of the sample, while variable primers are unique to each shark species, and identify the particular species of shark present. These DNA-based methods were demonstrated to be highly sensitive, with the ability to identify the species of origin of fresh and dried meat and fins, as well as highly processed products such as shark cartilage powder and canned shark fin soup (1). In one of these studies (1), in fact, a segment of whale shark DNA was analyzed as a control, and shown to be easily identifiable from that of other sharks. While these data are preliminary, they indicate the viability of DNA typing for whale shark product identification. We are in the process of characterizing sequences from the whale shark nuclear and mitochondrial genomes. These ongoing investigations will utilize our existing collection of whale shark tissue samples from populations across the world to design a DNA assay that will recognize all whale sharks, and differentiate these from other species of sharks.

References:

(1) Hoelzel, A.R. (1999) DNA identification of basking shark *Cetorhinus maximus* products in trade. (Contained in the report submitted by the United Kingdom in support of proposal 11.49 to add *Cetorhinus maximus* to Appendix II of CITES.)

(2) Shivji, M., et al. (2002) Genetic identification of pelagic shark body parts for conservation and trade monitoring. *Conservation Biology*, 16:1036-1047.

STATEMENT IN SUPPORT OF CITES PROPOSAL 12.35 (APPENDIX II LISTING FOR WHALE SHARKS)

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1. There exists adequate biological data indicating whale shark numbers are declining rapidly throughout their range. Data also suggests that the decline is the result of over-harvesting rather than a natural fluctuation of the population.

2. Countries that formerly harvested the whale shark are the very countries now seeking Appendix II listing for the whale shark.

3. The whale shark is the largest fish in the sea, reaching a length of 40 feet [+12m] and greater. It is a unique and charismatic animal that interacts harmlessly with humans. Alive, the shark generates economic benefits to countries that have developed whale shark tourism. Whale shark tourism generates significantly greater revenues than do whale shark fisheries. In addition, whale shark tourism provides a continuing and increasing revenue stream for the former fishers. This is why an increasing number of countries are taking their own initiatives to protect the whale shark.

4. Whale sharks travel though the waters of many range states, all of which could derive economic benefit from conservation of this animal.

5. Regarding implementation, the meat, fins and skin of whale sharks are visually distinctive. DNA of whale sharks is readily distinguishable from that of other shark species and thus genetic identification of whale shark material is now possible.

6. Neither the countries that wish to conserve whale sharks nor those that wish to fish them are benefited by ignoring scientific data. Whale sharks are rare animals whose numbers are fast declining.

SUMMARY: The Shark Research Institute supports approval of Proposal 35 listing the whale shark on Appendix II, but notes scientific data indicate this species meets the criteria for listing on Appendix I.