IUCN Status of Shark Species

IUCN Red List Categories (IUCN Red List Categories and Criteria Vers. 3.1):

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an **extremely high risk of extinction** in the wild.

ENDANGERED (EN)
"A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a **very high risk of extinction** in the wild."

VULNERABLE (VU)
A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a **high risk of extinction** in the wild.

NEAR THREATENED (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is **close to qualifying for or is likely to qualify for a threatened category in the near future**.

LEAST CONCERN (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

IUCN Status: Elasmobranchs – Sharks, Rays and Chimaeras

From IUCN Red List 2011

1041 species of sharks, rays and chimaeras:

Critically Endangered	25 (2.4%)
Endangered	43 (4.1%)
Vulnerable	113 (10.9%)
Near Threatened	132 (12.7%)
Least Concern	241 (23.2%)
Data Deficient	487 (46.8%)

17.4% Threatened = High, Very High or Extremely High risk of extinction
30.1% Threatened or Near Threatened

Hoffman et al 2010 applied the same % of classification categories to DD species. Using this approach, the number of species excluding the DD species is 554, and the percentage of each category excluding the DD species is as follows:

CE (4.5%)
EN (7.8%)
VU (20.4%)
NT (23.85)
LC (43.5%)

The updated number of species per category and overall percentages, incorporating this method of extrapolation to apply to the DD species works out to:

Critically Endangered	25 + 22 (from DD) = 47 (4.5%)
Endangered	43 + 38 (from DD) = 81 (7.8%)
Vulnerable	113 + 99 (from DD) = 212 (20.4%)
Near Threatened	132 + 116 (from DD) = 248 (23.4%)
Least Concern	241 + 212 (from DD) = 453 (43.5%)

~ 33% Threatened = High, Very High or Extremely High risk of extinction
~ 56% Threatened or Near Threatened

465 shark species:

Critically Endangered	11 (2.4%)
Endangered	15 (3.2%)
Vulnerable	48 (10.3%)
Near Threatened	67 (14.4%)
Least Concern	115 (24.7%)
Data Deficient	209 (44.9%)

Using the Hoffman et al. approach, the number of species excluding the DD species is 256, and the percentage of each category excluding the DD species is as follows:

CR (4.3%)
EN (5.9%)
VU (18.75%)
NT (26.2%)
LC (44.9%)

The updated number of species per category and overall percentages, incorporating this method of extrapolation to apply to the DD species works out to:

Critically Endangered	11 + 9 (from DD) = 20 (4.3%)
Endangered	15 + 12 (from DD) = 27 (5.8%)
Vulnerable	48 + 39 (from DD) = 87 (18.7%)
Near Threatened	67 + 55 (from DD) = 122 (26.2%)
Least Concern	115 + 94 (from DD) = 209 (44.9%)

~ 29% Threatened = High, Very High or Extremely High risk of extinction
~ 55% Threatened or Near Threatened

The vast majority of the Least Concern species consist of small catsharks, other types of carpet sharks, dogfish and other small species. None of these species is highly valued in the shark fin trade.

What's more important to focus on is the conservation status of the shark species that are subject to overfishing. The following sections provide more relevant information on the conservation status of the shark species that are subject to heavy fishery pressure, and more importantly, the species that are most prevalent in the shark fin trade.

IUCN Status: Pelagic Sharks and Rays

From Camhi et al. 2009 – "Conservation Status of Pelagic Sharks and Rays": Assessment categories for the shark species have not changed since this report.

64 species of pelagic sharks and rays:
4 EN
16 VU
15 NT
12 LC
17 DD

53 of these pelagic species are shark species:
2 EN
16 VU
= 18 --> 34% of open ocean shark species are at high or very high risk of extinction

+ 12 NT - meaning "plants and animals that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme" (www.iucnredlist.org/about).
= 30 --> 56.6% of open ocean shark are classified as of high conservation priority.

+ 13 DD "cannot be evaluated because of insufficient information" (www.iucnredlist.org/about)

Hoffman et al 2010 applied the same % of classification categories to DD species. Using this approach (40 species excluding DD), ~ 6 of the DD species would be assessed at high or very risk of extinction and ~ 10 would assessed as of high conservation priority (threatened or near threatened) if they were fully evaluated.
= 47 --> ~ 89% of open ocean shark species are likely to be of high conservation priority.

Least Concern shark species:
10 (~19%) open ocean shark species are assessed as Least Concern (Camhi et al. 2009). None of these LC species is found to be prevalent in the shark fin trade, and 8 out of the 10 are very small species that are of little interest to fisheries - 3 pygmy shark species, 3 cookie cutter shark species, 2 lantern shark species (IUCN Red List 2011).

The only LC open ocean shark species that reach a maximum size of greater than 50cm are the salmon shark and the goblin shark (IUCN Red List 2011). The justification

for the Salmon shark LC assessment is based on the "most recent demographic analysis" in the eastern and western north Pacific (Goldman 2002) and cites the very limited level of fishery pressure on this species, from directed fisheries or bycatch. The assessment notes, however:

"The conservation status of this species is still of some concern because there is so little data on catch in other fisheries, discards and potential finning from the major pelagic fisheries in the north Pacific. There is a great need to document the bycatch in U.S. State and Federal waters in order to foster responsible management of this species, as well as to obtain catch records from the northwest and central Pacific." (Goldman et al. 2009).

The goblin shark is a very deepwater species that is rarely caught in fisheries (Duffy et al. 2004).

IUCN Status: Oceanic Pelagic Sharks and Rays

From Dulvy et al. 2008 “You can swim but you can’t hide: the global status and conservation of oceanic pelagic sharks and rays”

- Evaluated 21 species of oceanic pelagic sharks and rays occurring in top 200m of the ocean

- 30 oceanic pelagics in total, but analysis limited to species usually caught in high seas fisheries

- 16 of these species (76%) classified by IUCN as Threatened or Near Threatened

    - 1 EN
    - 10 VU
    - 5 NT
    - 3 DD
    - 2 LC

- 16 of the 21 are shark species -- 13 of these shark species (81.5%) classified by IUCN as Threatened or Near Threatened

    - 10 VU (62.5%)
    - 3 NT (19%)
    - 2 DD (12.5%)
    - 1 LC (6%)

- The one species assessed as Least Concern was the Salmon Shark

    - “salmon shark is now subject to reduced fishing pressure on the high seas and management measures in the small part of its range where it is fished”
    - “salmon shark has low productivity with an annual rate of increase of ~8% yr^{-1} and potentially low capacity to withstand fishing mortality”
    - “1950s and 1960s salmon sharks were taken in relatively large numbers (105 000–155 000 individuals yr^{-1}) in open ocean gillnet fisheries for Pacific salmon”
    - “Salmon shark populations now appear to be rebuilding after cessation of these fisheries, suggesting that there have been significant declines in fishing mortality (Nagasawa et al., 2002).”

Quotes from this study:

“Oceanic pelagic sharks and rays are threatened by over-exploitation in high seas fisheries, which is exacerbated for sharks by the high value and demand of their fins (Clarke et al., 2007).”

“Most shark species have valuable fins, which are traded internationally to meet the burgeoning demand for a delicacy ‘shark fin soup’. This demand is driven by rapidly growing Asian economies (Rose, 1996; Clarke, 2004; Clarke et al., 2006a, b). The fins of sharks are generally worth more than their meat, which creates an economic incentive to retain the fins and discard the carcass at sea } a practice known as ‘finning’.”

“Of the species identified in the Hong Kong shark fin market (~45%), a large proportion (~70%) were pelagic sharks (Clarke et al., 2006a). The median number and biomass of sharks entering the shark fin trade each year have been estimated at 38 million individuals and 1.7 million mt, respectively (Clarke et al., 2006b). These figures suggest that shark catches may be 3-4 times as large as those recorded in the United Nations Food and Agriculture Organization (FAO) fisheries landings database (Clarke et al., 2006b).”

“In the past, only a few oceanic pelagic shark species were targeted, primarily shortfin mako (Isurus oxyrinchus) and porbeagle (Lamna nasus), which have high-value meat. However, due to the high and growing demand for shark fins and declines in traditional food fish, others such as the blue shark (Prionace glauca), are increasingly targeted for both meat and fins (Clarke et al., 2007; Hareide et al., 2007).”

“Even when catches are reported they are usually not recorded to the species level. For example, only 15% of all shark catches reported to the FAO have been recorded by species (Lack and Sant, 2006). This lack of species-specific data poses a significant challenge to quantifying the impacts of exploitation on these species and may mask declines and local extinctions (Dulvy et al., 2000).”

IUCN Status: Shark species most prevalent in the shark fin trade

From Clarke et al. 2006 "Global estimates of shark catches using trade records from commercial markets"

The 14 shark species most prevalent in the shark fin trade:

Common Name	Scientific Name	Fin Product Name	IUCN Red List Status	IUCN Trend	Declines*
Blue shark	Prionace glauca	Ya Jian	NT	Unknown	60 – 87%
Shortfin mako shark	Isurus oxyrinchus	Qing Lian	VU	Decreasing	40 - > 99%
Silky shark	Carcharhinus falciformis	Wu Yang	NT	Decreasing	60 – 91%
Dusky shark	Carcharhinus obscurus	Hai Hu	VU	Decreasing	62 – 92%
Sandbar shark	Carcharhinus plumbeus	Bai Qing	VU	Decreasing	65 – 97%
Tiger shark	Galeocerdo cuvier	Ruan Sh	NT	Unknown	65 - > 97%
Hammerhead Scalloped/Smooth	Sphyrna lewini/zygaena	Chun Chi	EN / VU	Unknown / Decreasing	64 - > 99%
Great hammerhead	Sphyrna mokarran	Gu Pian	EN	Decreasing	79% - total collapse
Thresher sharks Common, Bigeye, Pelagic	Alopias	Wu Gu	VU	Decreasing	50 – 83%
Bull shark	Carcharhinus leucas	Sha Qing	NT	Unknown	98.6 – 99.99%
Oceanic whitetip	Carcharhinus longimanus	Liu Qiu	VU	Decreasing	70 – 99%

*** Regional declines cited in scientific literature. The range in numbers is due to studies of declines in different regions over different time periods. Most numbers refer to declines over a 20 to 30 year period (approximately 2 to 3 generations).**

Of these 14 species, **100% are classified by IUCN as Threatened or Near Threatened**, and over 71% are considered to be at high or very high risk of extinction in the wild (Endangered or Vulnerable) -- 2 EN -- 8 VU -- 4 NT – 0 LC – 0 DD.

Quotes from Clarke et al. 2006:

"Our median biomass estimate for the global shark fin trade* based on all fin positions combined (1.70 million tonnes year) is **more than four times higher than the mid-range FAO-based figure** (0.39 million tonnes), and **nearly three times higher than the high FAO estimate** (0.60 million tonnes year). Independent estimates for the three fin positions also indicate median values three to five times higher than the FAO-based figures. Differences between our estimates and the FAO figures may be attributable to factors suppressing FAO landings data such as unrecorded shark landings, shark biomass recorded in non-chondrichthyan-specific categories, and/or a high frequency of shark finning and carcass disposal at sea."

"In addition, our trade-based biomass calculations may underestimate global shark catches. For example, due to the lack of data on domestic production and consumption of shark fins by major Asian fishing entities such as in Taiwan and Japan, unless exported for processing and then re-imported, these fins are not accounted for within our methodology (Clarke 2004b). Furthermore, shark mortality, which does not produce shark fins for market, e.g. fishing mortality where the entire carcass is discarded, is also not included. **These discrepancies suggest that world shark catches are considerably higher than reported, and thus shark stocks are facing much heavier fishing pressures than previously indicated**."

** Note on comparison to FAO data: "Our trade-derived figures provide a basis for evaluating the quality of chondrichthyan (sharks, skates, rays and chimaeras) capture production data compiled by the Food and Agriculture Organization (FAO; Anon. 2005a), currently the only data base attempting to encapsulate global catches. The database indicates that in 2000 the capture production for chondrichthyans totaled 869 544 tonnes. However, of this amount 386 547 tonnes is reported in the undifferentiated 'sharks, rays, skates, etc. not elsewhere indicated' category, and thus may contain rays, skates and chimaeras that do not contribute to the shark fin trade. Of the FAO data that are differentiated, 218 080 tonnes (45%) are types of chondrichthyans used or potentially used in the shark fin trade, i.e. shark species or guitarfish or sawfish (Rose 1996). This figure (0.22 million tonnes) may be assumed to represent a low-end estimate. Applying the percentage (45%) to the undifferentiated capture production suggests that 174 531 tonnes of the undifferentiated capture production is used in the shark fin trade. Therefore, a reasonable, mid-range estimate of the total FAO capture production supporting the shark fin trade is c. 0.39 million tonnes. If we assume the shark fin trade utilizes all undifferentiated capture production, the estimate is c. 0.60 million tonnes (Fig. 2a).*

References:

Camhi, M., Valenti, S., Fordham, S., Fowler, S., Gibson, C. 2009. The Conservation Status of Pelagic Sharks and Rays. Report of the IUCN Shark Specialist Group, Pelagic Shark Red List Workshop. Tubney House, University of Oxford, UK, 19-23 February 2007.

Clarke, S. C., McAllister, M.K., Milner-Gulland, E.J., Kirkwood, G.P., Michielsens, C.G.J., Agnew, D.J., Pikitch, E.K., Nakano, H., and Shivji, M.S. 2006. Global estimates of shark catches using trade records from commercial markets. Ecology Letters, 9: 12.

Duffy, C.A.J., Ebert, D.A. & Stenberg , C. 2004. *Mitsukurina owstoni*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <www.iucnredlist.org>. Downloaded on **11 February 2012**.

Dulvy, N.K., J.K. Baum, S. Clarke, L.J.V. Compagno, E. Cortes, et al. 2008. You can swim but you can't hide: the global status and conservation of oceanic pelagic sharks and rays. Aquatic Conservation: Marine and Freshwater Ecosystems 18(5):459-482.

Goldman, K., Kohin, S., Cailliet, G.M. & Musick, J.A. 2009. *Lamna ditropis*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <www.iucnredlist.org>. Downloaded on **11 February 2012**.

Hoffman, M. et al. 2010. The Impact of Conservation on the Status of the World's Vertebrates. Science 330, 1503 (2010).

IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <www.iucnredlist.org>. Downloaded on **10 February 2012**.

UCN. (2001). *IUCN Red List Categories and Criteria: Version 3.1.* IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK. ii + 30 pp.

Virginia Institute of Marine Science (2010, October 26). Third of shark and ray species are threatened, study suggests. *ScienceDaily*. http://www.sciencedaily.com/releases/2010/10/101026184209.htm

Sources for Population Declines data:

1 Baum et al. 2003
2 Heuter & Simpfendorfer 2008
3 Ward and Myers 2005
4 Jiao et al. 2009
5 Ferretti et al. 2008
6 Dudley and Simpfendorfer 2006
7 Camhi et al. 2009
8 De Jong & Simpfendorfer 2009
9 Kotas 2004; 2009
10 Myers et al. 2007
11 Soriana et al. 2006
12 Bonfil et al. 2009
13 Baum et al. in press
14 Baum and Myers 2004
15 U.S. Pelagic Longline logbook data
16 U.S. Pelagic Longline research survey
17 Drift Gillnet Fishery landings from the US Pacific
18 Goldman et al. 2009
19 McAuley et al. 2005
20 Japanese Fisheries Agency 2006
21 Myers et al in prep (Analyses of survey data)
22 Musick et al. 2009
23 Boero and Carli 1979
24 Soldo and Jardas 2002
25 Cortes et al. in prep
26 2004 ICCAT Stock Assessment
27 O'Connell et al. 2007
28 NMFS Stock Assessment
29 R.T. Graham pers. obs. 2006