

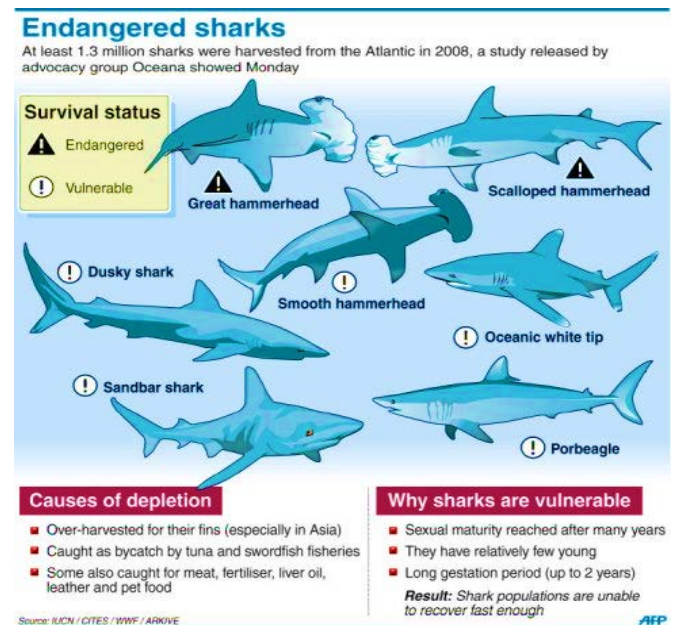


SHARKS IN 'HOT SOUP'

Dr Susan Bliss

The iconic fin of a great white shark cuts through the water, but is it soup bound? Who would have thought sharks could be pushed to the brink of extinction by a bowl of soup!

Figure 2: Endangered sharks



Source of diagram: <https://angelicagraceart.files.wordpress.com/2015/07/graphiconend.jpg>

Sharks – king of the ocean food web

Sharks are **predators** at the top of the aquatic **food chain**. Their diets play an important role in regulating the number of species below them, similar to the lions in Africa. Consequently a decline in sharks causes changes in aquatic ecosystems that trickles all the way down the food chain. Due to the trickle down effects sharks are able to reduce **algae blooms** that overgrow coral reefs and prevent photosynthesis. Species-rich coral reefs are frequently proof of a healthy population of sharks.

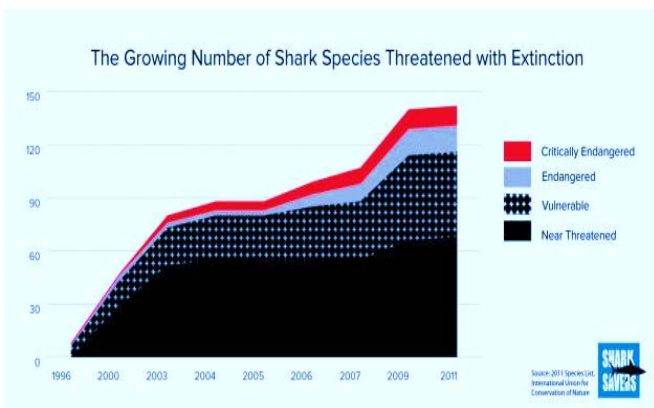
Endangered marine biomes

About 100 million sharks are killed each year in commercial fisheries for fins, meat and oil. As a result, over the last 20 years many species have dropped to 1%-10% of their original population. This has left 30% of species threatened with extinction.

The **World Conservation Union (IUCN)** noted that 150 shark species are listed as threatened or near threatened with extinction and under the **Convention on International Trade in Endangered Species (CITES)** only three sharks are protected such as the white shark, baking shark and whale shark.

At the present rate of **overfishing** it is predicted that in a few years many shark species could become extinct if **sustainable** programs are not implemented

Figure 1: Sharks threatened with extinction



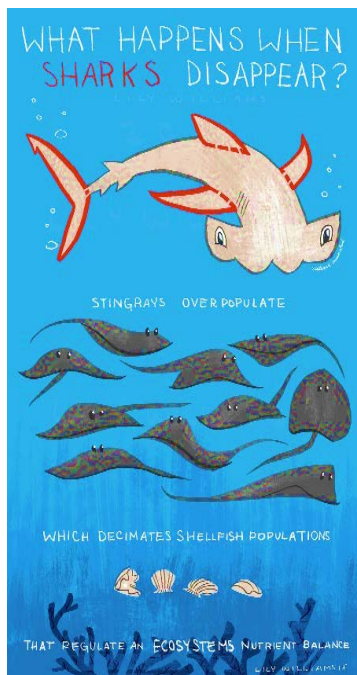
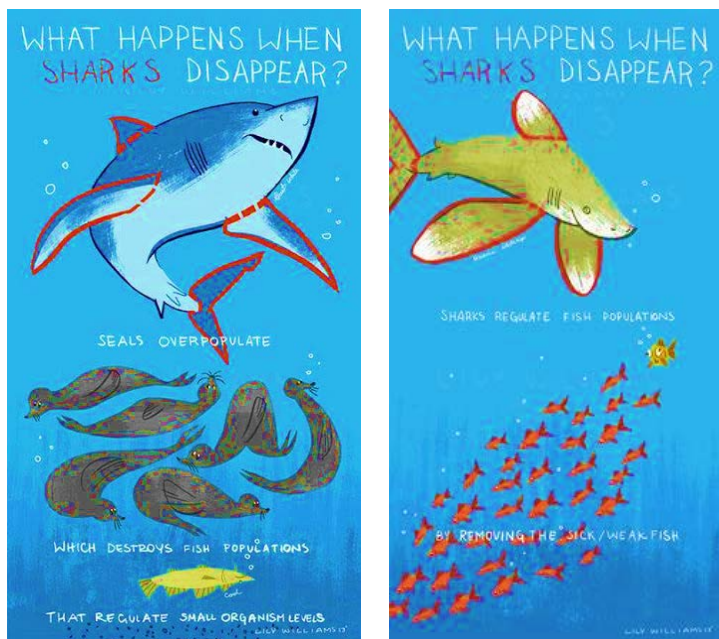
Source of graph: <http://www.sharksavers.org/files/cache/da92cf13c6b7afce295bb36f4df0b41e.jpg>

Interconnections & biomes: Sharks in 'Hot Soup'

Sharks tend to eat efficiently and hunt the old and sick aquatic species which prevents the spread of diseases as well as strengthening marine gene pools. Sharks consume the most vulnerable species while at the same time ensure stronger and healthier species remain alive. As a result when sharks are overfished marine ecosystems lose their balance.

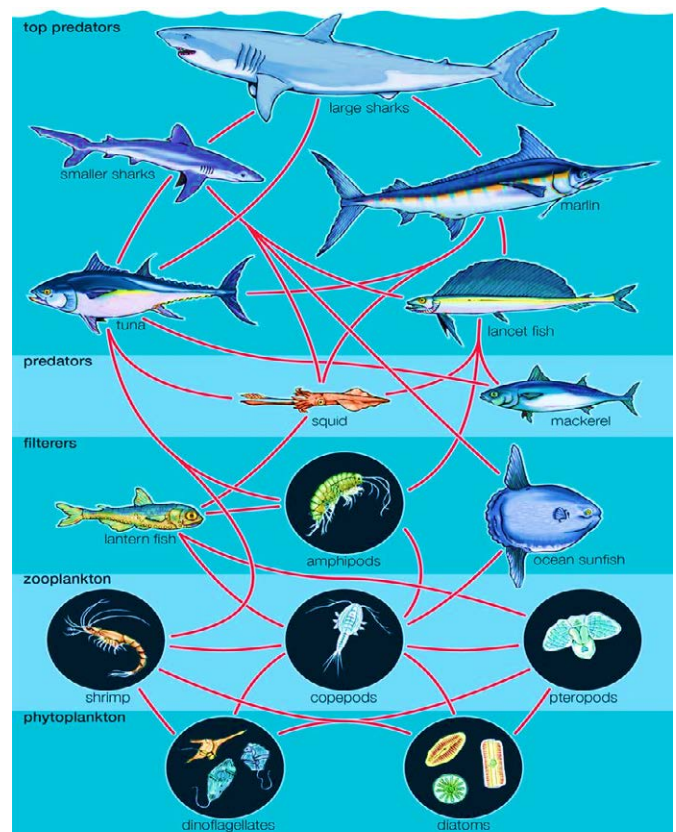
Removing sharks in large numbers can have ripple effects that throw entire ecosystems out of balance. Since sharks reach sexual maturity late their risk of extinction is higher than most other vertebrate species.

Figure 4: Changes to a marine ecosystem when sharks disappear



Source: <http://www.anonymousartofrevolution.com/2013/08/what-happens-when-sharks-disappear.html>

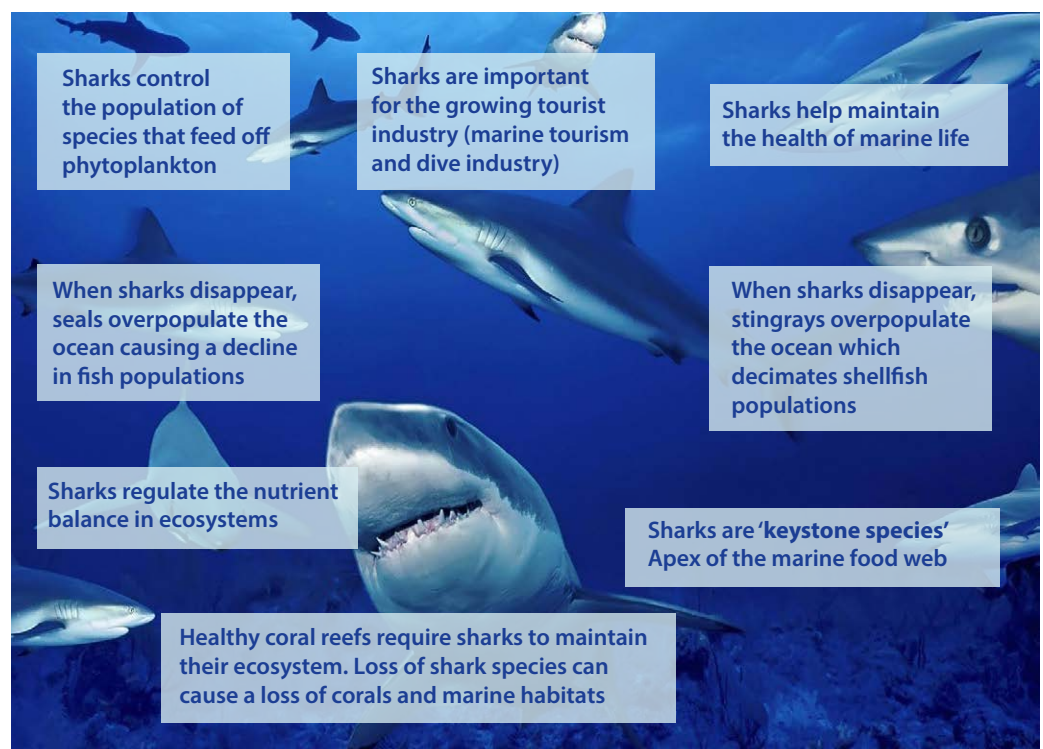
Figure 3: Food web of a shark



© 2010 Encyclopædia Britannica, Inc.

Source of food web: <https://s-media-cache-ak0.pinning.com/736x/5a/3a/fb/5a3afbcf9b88ea9e755052c4d9286498.jpg>

Figure 5: Importance of sharks in marine ecosystems



Source: <http://www.sharkattackdata.com/assets/images/Sharks-1920-1200.jpg>

Sharks in hot soup

Sharks are a common seafood around the world such as in China and Japan (shark-fin soup), Australia (flake), India (sora) and Iceland (hákarl).

Shark finning is the practice of removing shark's fins, then discarding the finless but living shark back into the sea. This cruel **illegal activity** involving about 145 countries **impacts** adversely on marine ecosystems:

- **Illegal:** Shark finning is mainly unmonitored and unregulated. Even though it is prohibited in several countries, the practice continues where law enforcement is lax.

- **Impacts:** Shark finning has contributed to 14 species threatened with extinction and a decline in some shark populations by up to 98% in the last 15 years. Demand for shark fins is depleting the oceans of their top predator and destabilising marine ecosystems. If sharks disappear **lower level prey** in the ecosystem (e.g. seals, sea lions) will increase.

As most of the **shark trade** is illegal and carried out in the black market, valid statistics of the declining numbers of sharks is impossible to determine. Without accurate catch data, sustainable management of shark fisheries is problematic.

Figure 6: Shark finning inquiry questions

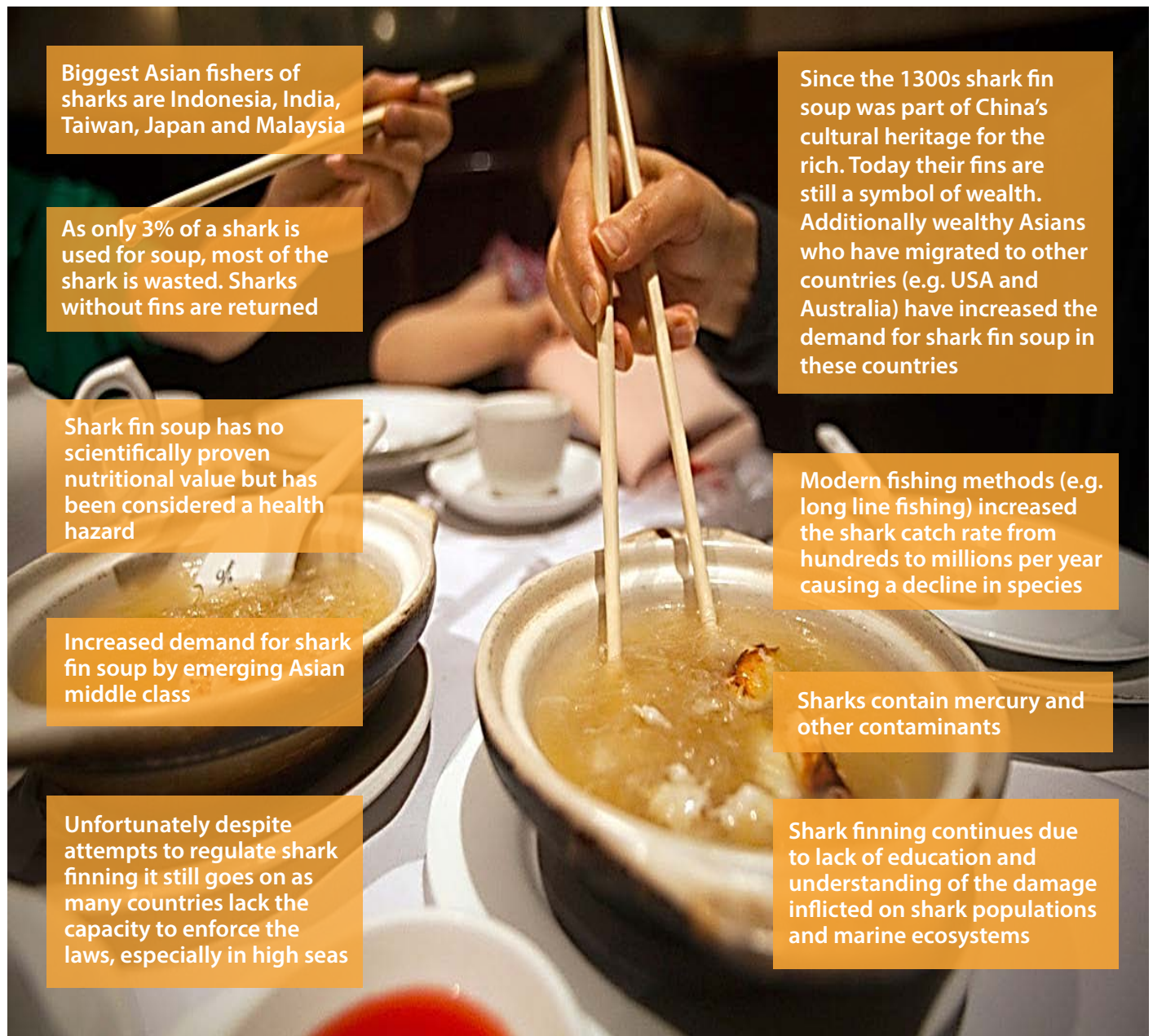


Photo: http://ocean.si.edu/sites/default/files/styles/colorbox_full_width/public/photos/ROTMAN_N13VZweb_1.jpg?itok=NJaP2tBi

Shark fin soup – extinction in a bowl

Each year 100 million sharks are killed for their fins with 73 million used in the Asian delicacy, shark fin soup. Shark fins are among the world's most expensive seafood products, fetching up to \$1000 per kilogram in comparison with prawns retailing at \$15-\$30 per kilogram. Some soups cost \$150 a bowl!

Figure 7: Shark fin soup in Asia—causes and impacts



Source photo: http://images.earthtouchnews.com/media/385757/shark-fin-soup_2014_08_12.jpg

Interconnections: the culprits!

The fate of the world's sharks are in the hands of twenty countries that account for 80% of the global shark catch. Indonesia is currently the world's largest supplier of shark fin products, with the trade primarily driven by China's appetite for shark fin soup. In 2011 over 10.3 million kilograms of shark fins and shark fin-based products were imported into Hong Kong.

Figure 8: Main countries that catch sharks and import sharks for soup

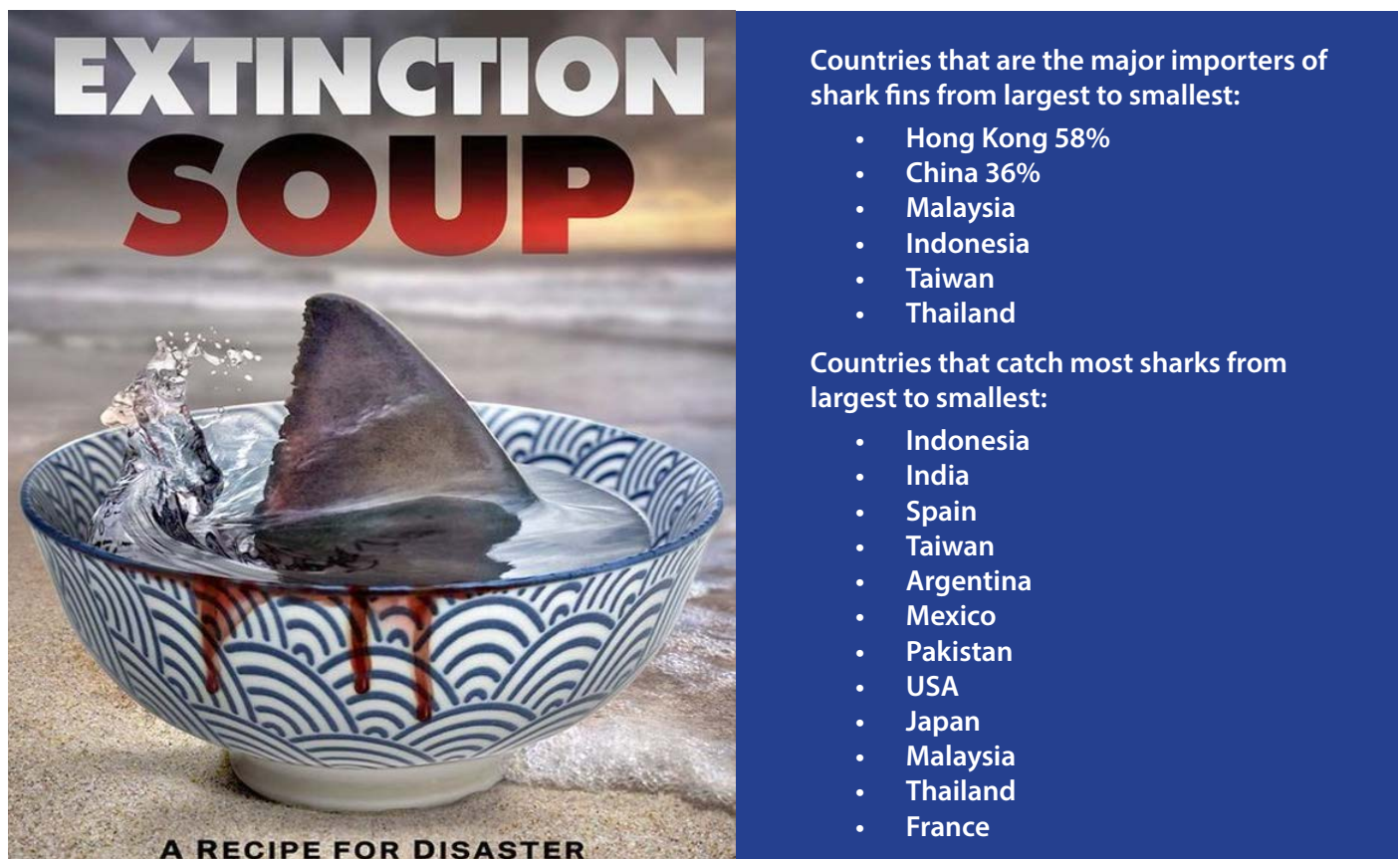


Photo: <https://s-media-cache-ak0.pinimg.com/564x/b5/ab/2f/b5ab2fb3290d7792c7e9f390988d5613.jpg>

Figure 9: Kesennuma, Japan – major shark fin port

Kesennuma located north of Tokyo accounts for 90% of the country's shark fin trade. It is the city's commercial lifeblood supporting 2,000 workers. In summer, busloads of tourists arrive every day to consume the country's best shark fin soup.

About 130 ships spend up to 150 days at sea casting baited lines several kilometres in length between Japan and Hawaii. Most of the shark fins are dried and sold to restaurants in Japanese cities. A smaller quantity is exported to China and Hong.

Unfortunately, large sections of the city and its port were destroyed by the 2011 Tōhoku earthquake, tsunami and fires on March 11, 2011



Kesennuma fishing port, Miyagi prefecture Japan. Source: https://commons.wikimedia.org/wiki/File:Kesennuma_fishing_port,_-3_Oct._2007_a.jpg

Towards sustainable shark fishing

Unfortunately conservation laws have not prevented the decline in shark species. Instead more enforceable protective measures are required to avoid possible extinction of sharks in the future such as:

- **bans** on the trade and consumption of shark fins
- enforcing local, national and global **agreements** that protect sharks and promote sustainable shark populations
- establishment of shark **sanctuaries**
- **organisations** working for sustainable shark populations
- valuing shark **tourism** versus death of species

Figure 10: Agreements



Convention on International Trade in Endangered Species (CITES)

Conservation of Migratory Sharks (CMS)

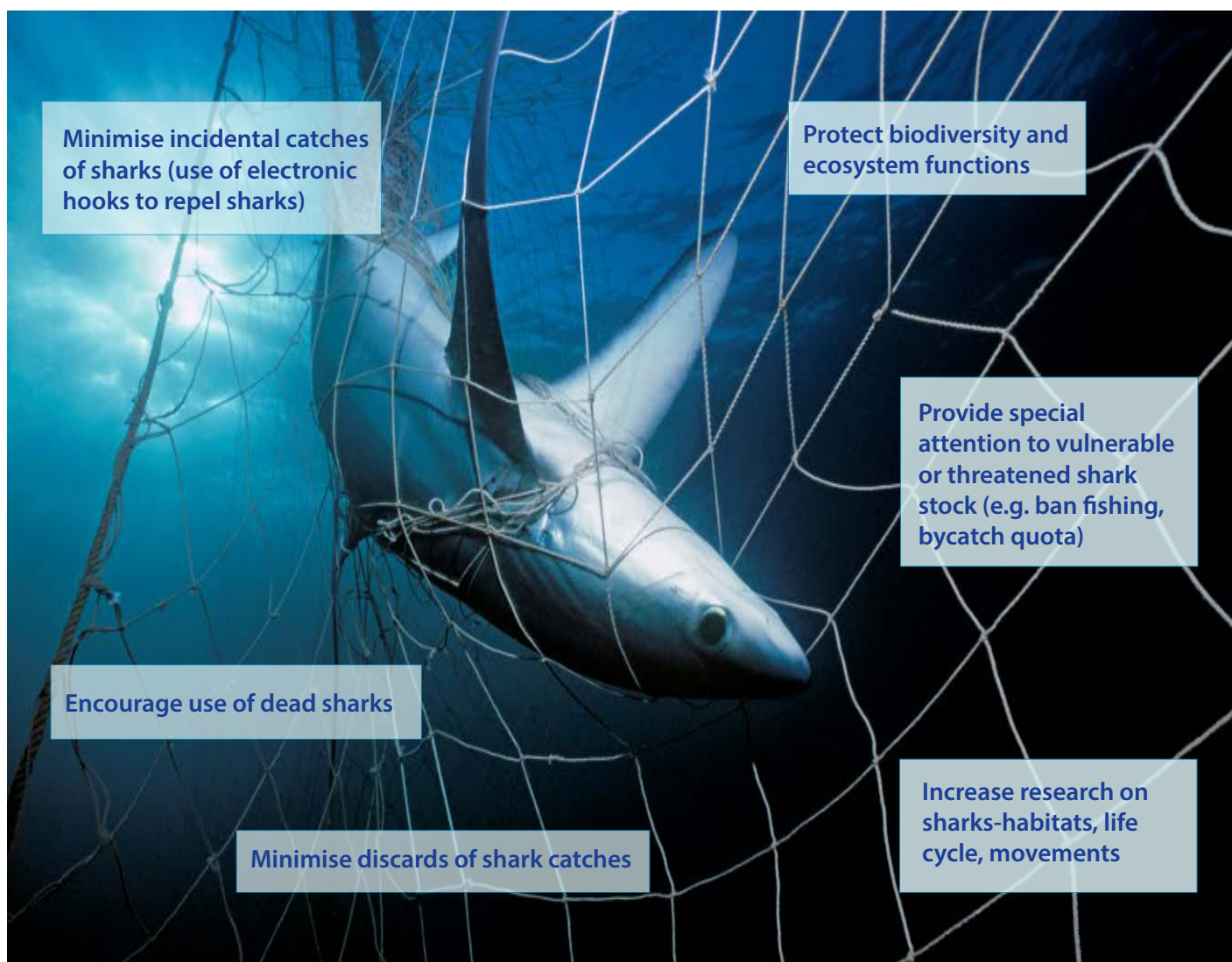
United Nations Convention on the Law of the Sea (UNCLOS)

International Plan of Action for Sharks (IPOA Sharks)

United Nations Fish Stock Agreement (UNFSA)

*No Shark Fin protesters, Japan.
Source: Wikimedia Commons*

Figure 11: Aims of International Action for Sharks (IPOA Sharks)



Interconnections & biomes: Sharks in 'Hot Soup'

Figure 12: Organisations working to save sharks



Save Our Sharks

- This organisation aims to educate people about the importance of these amazing creatures and their significance for the healthy functioning of marine ecosystems.



Asia Shark Conservation – Project Aware

- Was formed by divers who were concerned by the decline of sharks and rays at their favourite dive locations around Asia.
- In 2013, the scuba diving community helped protect an unprecedented number of sharks and rays from international trade



WildAid

- WildAid's campaigns, in combination with government bans have contributed to a decrease in shark fin consumption. The organisation's 'Chefs against Shark Fins' has raised awareness about shark finning, resulting in the decline in shark populations.
- In 2014, 23 airlines and 5 hotel chains banned shark fins, and the Malaysian government announced a government banquet ban on shark fins.



AUSTRALIAN INSTITUTE
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Australian Institute of Marine Science

- Aims to protect sharks as they mature late, produce few young, and are slow to recover from depletion.
- Conservationists recommend creating marine parks (watery national parks) to protect these endangered animals



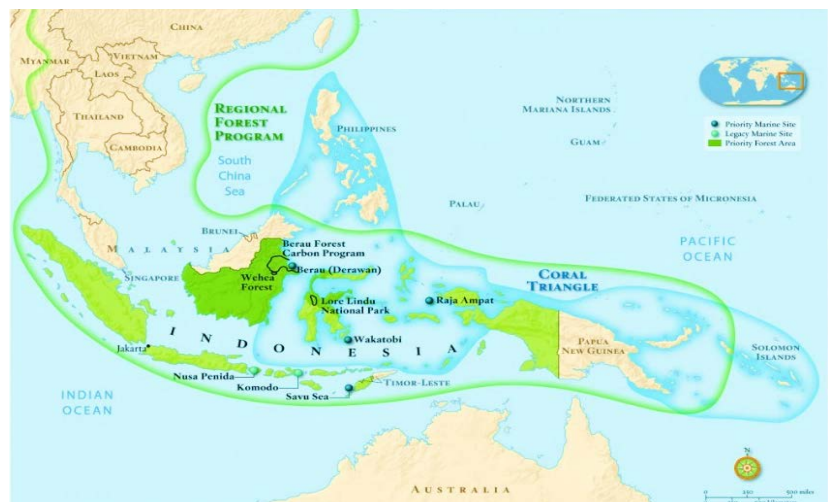
Figure 13: Marine Protected Area: Raja Ampat in Indonesia

Currently Indonesia ranks as the world's largest exporter of sharks and one of the largest contributors to the shark fin trade.

Coral Triangle

Raja Ampat is located in the **Coral Triangle** enjoys one of the **highest marine biodiversity on Earth**. It is known as the '**Amazon of the Ocean**' or '**Underwater Paradise**'. However, it has been the site of destructive fishing practices such as the use of poison and reef bombing. These practices have killed sharks and other marine species such as manta rays and turtles. As a result 75% of shark species found in Raja Ampat are threatened with extinction.

Map of the Coral Triangle



Source: <http://methoshomestay.com/wp-content/uploads/2014/02/Coral-Triangle.jpg>

Interconnections & biomes: Sharks in 'Hot Soup'

Shark Sanctuary

In 2010 **Raja Ampat Shark and Ray Sanctuary** was established. The sanctuary covers an area larger than Denmark. This means that all harvesting of sharks for their fins, mantas for their gills and reef fish for aquariums, are prohibited in its waters. In 2012, 33 shark finners were apprehended in the Raja Ampat Marine Protected Area.

As the area is at risk from both overfishing and climate change, environmentalists support the establishment of the protection zone and its extension to 20 million hectares by 2020.

Economics versus the environment

The value of (living) sharks and manta rays outweighs the one-time profit of dead sharks and manta rays. Sharks are critical to sustainable fisheries, healthy coral reefs and the marine ecotourism industry. They contribute to the incomes of local communities as many villagers are part of the underwater ecotourism (diving) industry.



Raja Ampat Islands, Indonesia. Source: https://commons.wikimedia.org/wiki/File:Raja_Ampat_Islands_-_journal.pbio.1001457.g001.png



Pulau Gam, Raja Ampat. Source: https://commons.wikimedia.org/wiki/Category:Raja_Ampat#/media/File:Boat_and_corals_near_Pulau_Gam,_Raja_Ampat.jpg

Palau signs National Marine Sanctuary into Law

In 2015, the creation of the national marine sanctuary makes Palau the first country to declare the waters of its entire exclusive economic zone (EEZ) a marine protected area, with an integral part of the sanctuary a fully protected "no take" zone of 500,000 square kilometres.

The Pacific island nation now leads the world in highest percentage of its exclusive economic zone set aside for full protection. The legislation creating the sanctuary designates 80% of the nation's maritime territory as a fully protected marine reserve in which no extractive activities, such as fishing or mining, can take place. About 20% of Palau's waters will become a domestic fishing zone reserved for local fishermen and small-scale commercial fisheries with limited exports



Ecotourism – Kayak paddling through the forest at Rock Islands, Palau. Source: https://commons.wikimedia.org/wiki/File:Paddling_at_Rock_Islands,_Palau.jpg

Figure 14: Palau-ecotourism

Palau consists of 250 islands located in the Pacific Ocean. These tropical islands, SW of the Philippines, are a haven for snorkelling and diving. Unfortunately Palau was facing overfishing from rampant shark-finning by foreign long-line fishing vessels licensed by the Palau government to fish in their waters.

As a result the Palauan government implemented the **Marine Protection Act** (1994) to preserve the aquatic environment and in 2009 Palau created a **shark sanctuary** to support the local community that has selected to protect, rather than hunt, its sharks. As a consequence, Palau now forbids commercial shark fishing within its **Exclusive Economic Zone** (EEZ) waters.

Interconnections & biomes: Sharks in 'Hot Soup'

Figure 15: News

Good news

- Public attitudes towards shark fins are changing. Leading Indian airline (Jet Airways) bans shark fins as cargo and is committed to protecting shark populations and marine ecosystems.
- In 2012 China's State Council called for a ban on serving shark fin at official government functions.
- In 2014, conservation organisations such as WildLife At Risk (WAR) contributed to a decline in the sales of shark fins in China by 70%. This change makes it essential for restaurants and caterers in China to develop sustainable menus.
- 'The British celebrity chef Gordon Ramsay highlighted the cruelty involved in finning – the

practice of removing fins and discarding the body – in a recent TV documentary, while several Chinese restaurants in London have removed the soup from their menus.' <http://www.theguardian.com/environment/2011/feb/11/shark-fishing-in-japan>

Bad news

- 2014: *'The world's largest slaughtering facility for whale sharks — an internationally-protected endangered species — has been discovered, near Wenzhou, in China.'*
'The factory, which operates openly, is reportedly slaughtering over 600 whale sharks annually to produce shark oil for health supplements.'
<http://www.wildliferisk.org/china-whale-sharks/>

Figure 16: Citizenship: What can you do?



- **Don't eat shark fin soup**
- **Avoid eating at restaurants that sell shark fin soup**
- **Support one of the many organisations fighting to save sharks, such as the Humane Society International, Sea Shepherd, Shark Angels and Oceanic Defence**
- **Write to your local member of parliament and ask him/her to consider banning shark fin soup in your city or town**
- **To avoid extinction, Seafood Watch recommends everyone should avoid eating sharks, and has developed a responsible seafood purchasing guide available on mobile devices such as the iPhone.**

Geofacts

- Australia imports shark fins from Asian countries
- Flake sold in fish and chips shops in Australia is frequently shark
- In 2012, a female grey nurse shark was found alive with its fins sliced off on a beach near Evan's Head NSW, and a finless shark was found within the Great Barrier Reef Marine Park.
- In 2014 Australia exported 180 tonnes of shark fins to Hong Kong, the Philippines and Singapore
- Only 3% of the shark's body weight are high value fins
- There are over 1,000 different species of sharks





ACTIVITIES

Knowledge, understanding, skills, values

Write True or False for the following statements on sharks:

- Slow to recover from depletion (T)
- Shark fin soup is nutritious (F)
- Sharks effect the health of coral reefs (T)
- Sharks are only found in salt water (F)
- You are more likely to be killed by a shark than a bee sting.(F)

Figure 1:

- Compare the number of shark species threatened with extinction in 1996 with 2011. List the reasons for extinction.

Figure 2:

- Name two endangered sharks and the causes of their depletion.
- Explain why sharks are vulnerable to extinction.

Figure 3:

- Describe the links between phytoplankton and sharks in a food web.

Figure 4:

- Explain what occurs to the marine ecosystem when sharks disappear.

Figure 5:

- Discuss the importance of sharks in a marine ecosystem.

Figure 6:

- Answer the inquiry questions as a short TV report on shark finning.

Figure 7:

- List the reasons for consuming shark fin soup.

Figure 8:

- Name three countries that catch sharks and three countries that import sharks for soup.
- Explain what 'extinction' soup means.
- Shark fin soup is a danger to humans, the environment and to sharks. Explain this statement.

Figures 10, 11, 12:

- In groups discuss how agreements, IPOA Sharks and organisations, aim to improve the number of sharks swimming in our oceans.
- 'Unfortunately conservation laws have not prevented the decline in shark species.' Explain this statement.

Figure 13:

- Where is the Coral Triangle? Why is the Coral Triangle important to sharks? Where is Raja Ampat located? What is the aim of the shark sanctuary? Describe how Raja Ampat has implemented sustainable laws and procedures to reduce the decline in shark populations.

Figure 14:

- Where is Palau? What strategies has Palau introduced to conserve marine species such as sharks?

Interconnections & biomes: Sharks in 'Hot Soup'



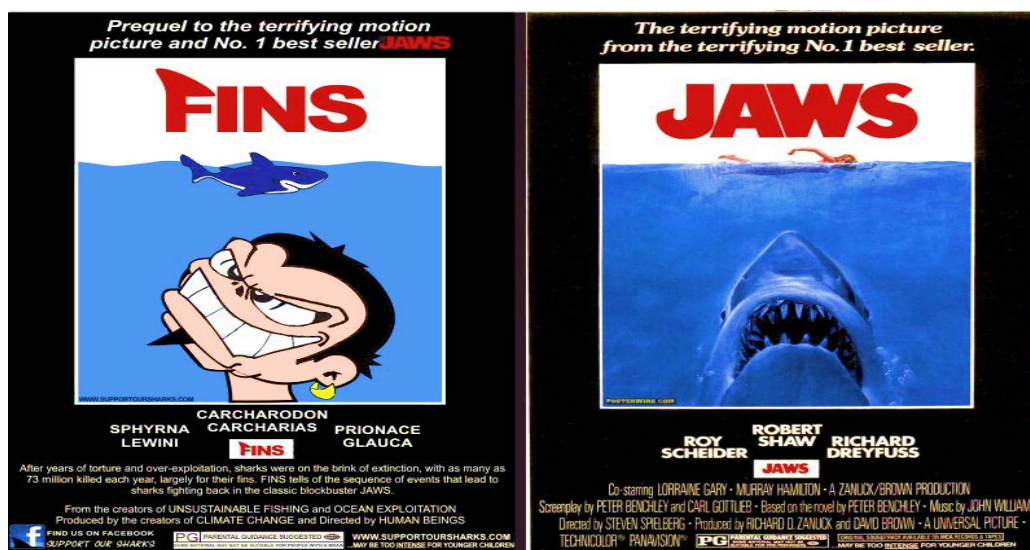
Investigation

cartoon analysis

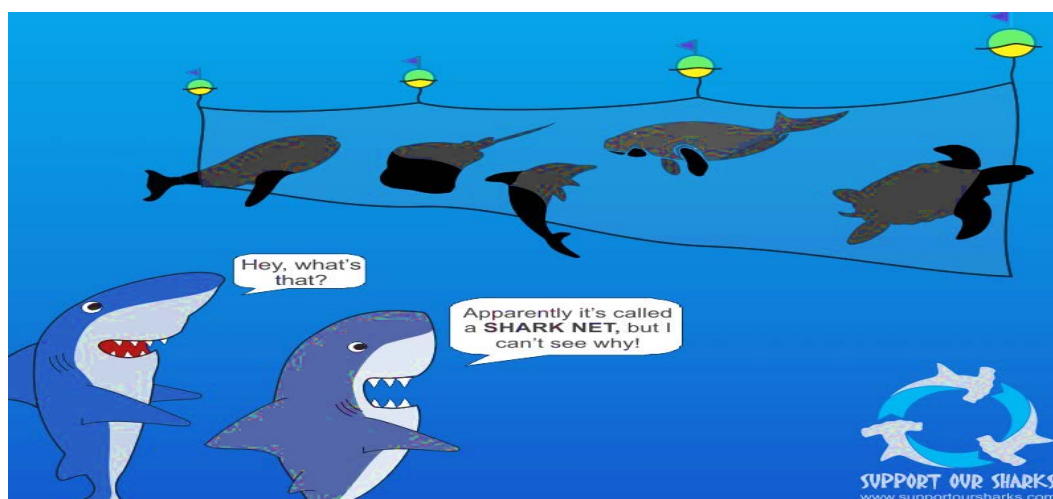
In pairs refer to the following cartoons and explain the messages



Cartoon: <http://shaaark.com/shark-cartoons/2012/04/shark-cartoon-184.jpg>



Cartoon: <http://www.supportoursharks.com/en/education/Gallery/Cartoons/12.htm#Anchor>



Cartoon: <http://www.supportoursharks.com/en/education/Gallery/Cartoons/18.htm#Anchor>

Interconnections & biomes: Sharks in 'Hot Soup'



Investigation

Group work:

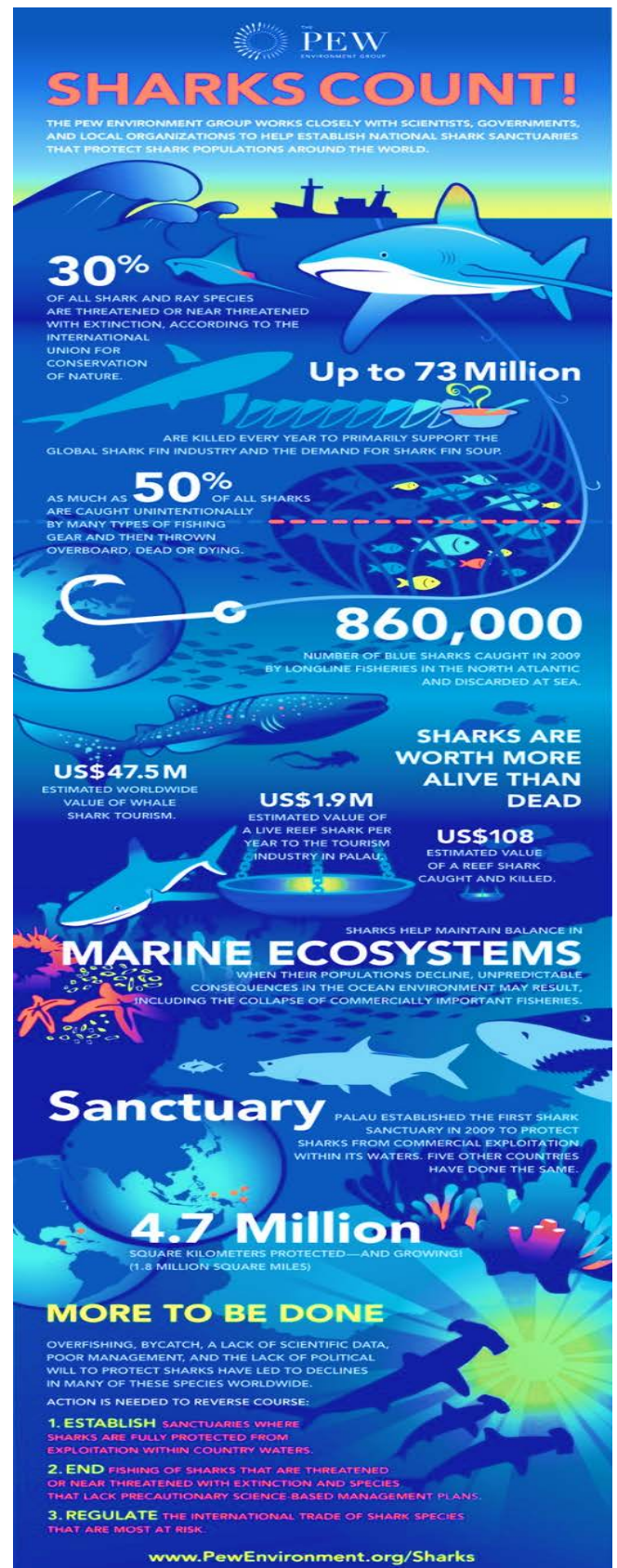
- Sharks are not commonly found in **Hong Kong's** surrounding ocean, but the city is the centre of the lucrative shark fin trade. The city accounts for around 50% of the global shark fin trade every year. Additionally, the WWF found that *'shark fin soup is served at 98% of Hong Kong restaurants as restaurants choose money over the environment.'*
- In groups, research this topic and discuss strategies that have been introduced to reduce the consumption of shark fin soup in Hong Kong. Present your findings as an oral report.

Infographic: Sharks count

- What is the message in the infographic-Sharks count?
- Explain why sharks are worth more alive than dead.
- Discuss what is meant by *'more to be done?'*

ICT: Research the following questions using the internet

- Explain the terms: predator, food chain, lower level prey, marine parks, sustainable, and Exclusive Economic Zone
- Describe the functions of the World Conservation Union (IUCN) and the Convention on International Trade in Endangered Species (CITES) and why they promote sustainability.
- In **groups** select one agreement for the protection of sharks such as: CITES, CMS, UNCLOS or UNFSA. Explain the aim of the agreement as a short report to the class.
- Refer to the OCEARCH website and the recent tracking of sharks. How is this technology useful? <http://www.ocearch.org/>.
- Examine the Ocean Park, one of Asia's largest shark aquariums. Describe the Park and how it promotes sustainable practices. <http://www.eglobaltravelmedia.com.au/ocean-park-launches-one-of-asias-largest-shark-aquariums/>



<http://pinterest.com/pin/282600945337899461/>

Interconnections & biomes: Sharks in 'Hot Soup'



Investigation

Scaffold:

- Discuss whether '*the shark is better alive than dead*' using the discussion scaffold.

General capabilities: Literacy, Numeracy, Critical and creative thinking, Ethical understanding, ICT

Cross-curriculum priority: Sustainability

Text type: Discussion

Purpose: Examine different sides of the controversial issue referring to valid facts and figures, from a variety of sources

Introduction – Outline the issue to be discussed	Language Features: <ul style="list-style-type: none">• Use subject specific terminology• Tense: past, present or future• Person: third (first and second may be appropriate)• Word choice: emotive, persuasive• Specifications: words and phrases to contradict the other side of the argument
Argument 1	For (positive) Against (negative)
Argument 2	For (positive) Against (negative)
Argument 3	For (positive) Against (negative)
Conclusion	Summary of different points of view Judgement/Recommendation favouring one side of the discussion or decision on what course of action to follow

E-poster:

- Design a poster promoting the two perspectives on sharks – '*kill or keep*'

Interconnections & biomes: Sharks in 'Hot Soup'



Image: <http://i2.cdn.cnn.com/cnnnext/dam/assets/160329184940-sleeping-with-sharks-natpkg-orig-00000000-exlarge-169.jpg>

YouTube/Video/ICT

- Over 73 Million Sharks Killed Every Year for Fins 6.25min, 23/9/2010, <http://www.youtube.com/watch?v=mO7hvOtYnck&feature=fvst>
- Shark Fin Soup 2.46min, 8/4/2009 <http://www.youtube.com/watch?v=mCqPXhxxZlg&feature=fvst>
- Raja Ampat <http://www.sharksavers.org/en/blogs-news/shark-savers-blog/raja-ampat-shark-sanctuary-comes-law-in-indonesia/>
- Underwater with WWF in Raja Ampat <http://www.worldwildlife.org/videos/underwater-with-wwf-in-raja-ampat-coral-triangle>
- Shark fining – Humane Society International http://www.hsi.org/issues/shark_finning/
- Losing flavour <https://www.scmp.com/sites/default/files/styles/486w/public/2014/04/09/75f682444d67582fca5ceff980e23594.jpg?itok=lo42JSU0>
- Refer to websites and YouTube for more information
 - <http://www.fao.org/docrep/005/x3690e/x3690e1g.htm>
 - <http://rtseablog.blogspot.com.au/2011/10/industrial-shark-fishing-shark.html>
 - http://saveourseas.com/articles/how_many_sharks_are_caught_each_year
 - <http://www.sharkwater.com/education.htm>
- Sharks in the Coral Triangle <http://www.projectaware.org/update/poor-fisheries-management-endangers-sharks-coral-triangle>
- Seafood Watch http://en.wikipedia.org/wiki/Seafood_Watch
- International Plan of Action for sharks <http://www.fao.org/fishery/ipoa-sharks/about/en>

Curriculum F–10 across subjects

- **Geography and Science notes and activities**
 - **National Geographic** http://education.nationalgeographic.com/archive/xpeditions/lessons/14/g912/recordsharks.html?ar_a=1
- **Years F–3** http://coralreef.noaa.gov/education/educators/resourcecd/activities/resources/elementary_sa.pdf

Students explore the natural history of sharks and recognise that humans are an interconnected part of sharks' ecosystems. The student will be able to:

 - create an artistic impression of a shark and identify shark body parts;
 - describe what sharks eat;
 - explore ways to measure the size of a shark;
 - portray a shark's ecosystem; investigate the sense of smell;
 - discuss ways people impact on shark populations
 - make suggestions on how people can conserve sharks
- **Years 4–6** http://coralreef.noaa.gov/education/educators/resourcecd/activities/resources/elementary_sa.pdf

Students discuss why sharks need conservation and suggest conservation strategies.
- **Years 3–8** <http://www.ocearch.org/>

The website has lessons for years 3–5 (Cartography/ Geography and Maths) and years 6–8 (Oceanography, Biology, Physics, Chemistry and Maths).