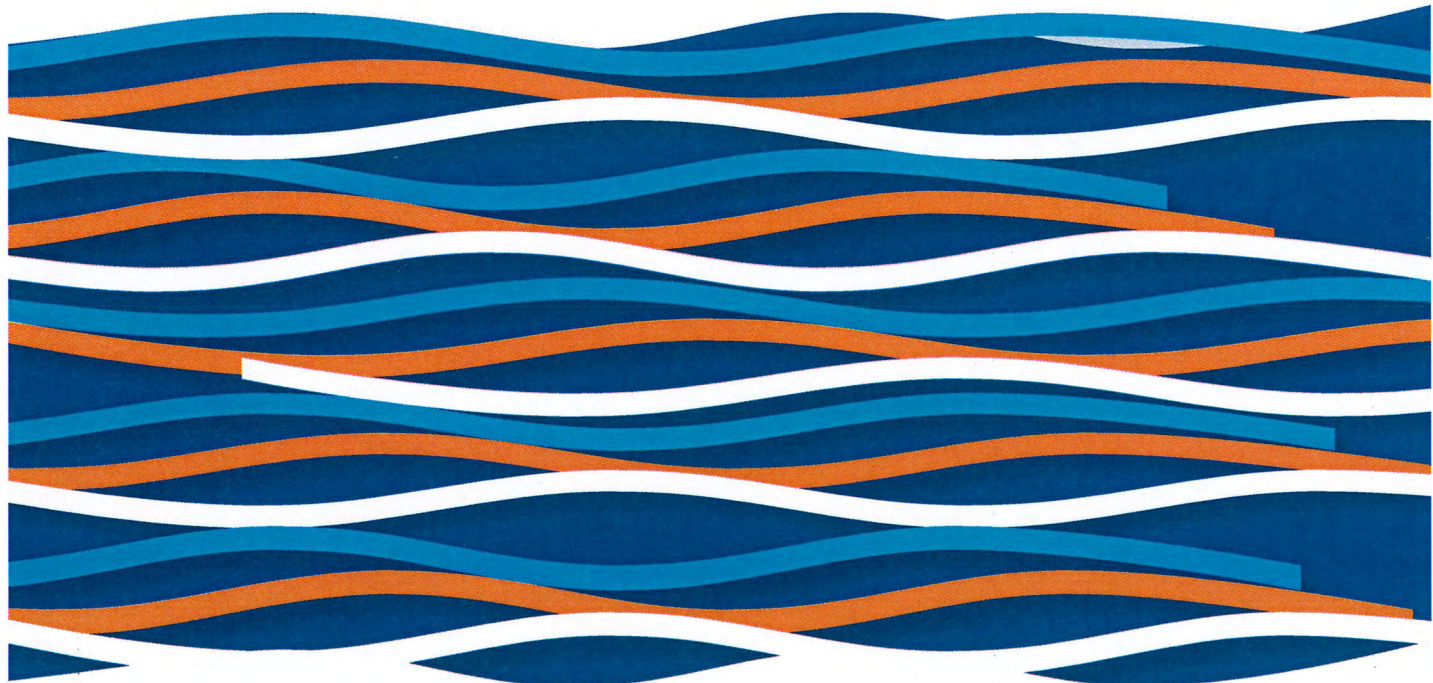


NORTHERN TERRITORY

Offshore Net and Line Fishery

Environmental Management System



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OVERVIEW OF ENVIRONMENTAL MANAGEMENT SYSTEM

This Offshore Net and Line fishery EMS establishes a process for planning, implementing, reviewing and improving the actions of operators in the Offshore Net and Line fishery to manage risks and opportunities relating to;

- environment
- food quality and safety
- occupational health and safety
- profitability
- public relations and communications

PURPOSE

- To document how Offshore Net and Line Licensee Committee members are currently meeting, and will continue to meet, their responsibilities as users of a public resource.
- To provide a basis for Offshore Net and Line Licensee Committee members to communicate and cooperate with other resource users and resource managers involved with the Offshore Net and Line fishery.

SCOPE

The EMS encompasses environmental, economic and social aspects of fishing operations conducted by Offshore Net and Line Licensee Committee members, to ensure that the ecologically sustainable development of the fishery is maintained.

DEVELOPMENT

The EMS is based on a risk analysis of the commercial Offshore Net and Line fishery. Risks which the Committee has direct influence over are internal risks and can be managed. External risks are those which are associated with the activities of other people which may directly or indirectly impact on the Offshore Net and Line fishery.

Based on the risk analysis, the Offshore Net and Line Licensee Committee has developed a suite of practical guidelines, including a Code of Conduct, Code of Practice and advice on interactions with turtles and sawfish. This suite of guidelines and commitments is the core of the EMS.

REVIEW

The success of actions against objectives will be reviewed annually. An annual EMS summary report will be produced and distributed to all Offshore Net and Line Licensee Committee members and made available to other stakeholders.

OVERVIEW OF FISHERY

The Offshore Net and Line fishery is a pelagic net and pelagic and demersal longline fishery operating in the area from high water mark at the coast, seaward to the outer boundary of the Australian Fishing Zone, between the Queensland and the Western Australian maritime borders.

Offshore Net and Line commercial fishing targets several species of shark, a key one being Black tip shark (*Carcharhinus tilstoni* & *Carcharhinus sorrah*), as well as Grey mackerel (*Scomberomorus semifasciatus*). A variety of other pelagic fish are also landed. Surface set nets are the most commonly used method to catch shark, although longlines are a permitted gear type. Each licence is allowed up to 2 km of net and 20 km on longline.

The fishery has been accredited by the Commonwealth Department of the Environment and Heritage as being ecologically sustainable for export. This assessment allows the fishery to export it's product with exemption from reporting until November 2007.

To maintain the ecological sustainability of the fishery, management arrangements were revised in 2005. Each licence had a number of net fishing and longline fishing days allocated to it on 1 July 2005. These fishing days are both temporarily and permanently transferable to another licence holder in the fishery.

Vessels often spend considerable time at sea during each fishing voyage. Fishermen base their operations around purposely fitted out vessels that are designed specifically for the use of surface nets or longline. Fishing usually occurs at night when sharks are generally more active and move to the surface to feed.

A joint authority (Northern Territory and Commonwealth Ministers) manages the fishery under the Northern Territory Fisheries Act. This is as a result of an Offshore Constitutional Settlement Agreement between the Northern Territory and the Commonwealth, first signed in 1995.

LICENSEE COMMITTEE ENVIRONMENTAL POLICY

VISION

To responsibly conduct the harvesting of resources in the Northern Territory Offshore Net and Line fishery on behalf of the community to ensure continued resource and ecological sustainability and economic viability.

NT Offshore Net and Line Licensee Committee members are committed to;

- taking all reasonable measures to minimise impacts on the environment
- promoting harmonious relations with other resource users and relevant land holders
- ensuring a continuous supply of high quality seafood to the community

OBJECTIVES

1. Continue to protect the habitats which underpin the ecological health of the Offshore Net and Line fishery.
2. Ensure that the overall harvest of shark and Grey mackerel resources remain within sustainable biological limits.
3. Minimise interactions with and impacts on non retained species.
4. Conduct environmental management in a transparent and cooperative manner with other key stakeholders.
5. Actively participate in reviews, legislation development and resource management decision making forums.
6. Support research which enhances ecological sustainability, productivity, protection of the environment and the viability of fishing operations.
7. Promote and participate in industry training and education opportunities in environmental awareness, conservation principles and good management practices.
8. Minimise resource consumption, waste production and pollution associated with fishing operations.
9. Comply with all relevant legislation.

EMS ACTION PLAN

The Offshore Net and Line Licensee Committee has identified and committed to a series of objectives, strategies and performance indicators to maintain the ecologically sustainable development of the fishery. Where information gathered indicates actual or possible problems, the relevant management arrangements will also be reviewed for their effectiveness.

OBJECTIVE 1

Continue to protect the habitats which underpin the ecological health of the Offshore Net and Line fishery.

Marine Pests

Strategy

Generally monitor and report, together with samples if possible, any unusual plants or animals observed in an area.

Report every sighting of foreign fishing vessels in Australian waters.

Performance Indicator

Timely reporting of unusual plants or animals that are detected.

Timely reporting of foreign fishing vessel sightings.

Background

With the significant increase in illegal foreign fishing vessels in waters off the NT, and reported landings on NT soil by illegal Indonesian fishermen, the chances of marine pest incursions occurring have significantly increased. Commercial fishermen are often among the first to observe abnormal situations involving illegal vessels.

Water pollution incidents

Strategy

Monitor areas being worked for debris and other water pollution and report incidents to the Pollution Hotline, 1800 064 567.

Review marine pollution reports annually.

Performance Indicator

Timely reporting of pollution incidents.

Reviewed annually.

Nursery Areas

Strategy

Continue to work with Fisheries research to identify shark nursery areas around the NT coast.

Performance Indicator

Nursery areas identified and appropriate management measures developed and implemented.

Background

Nursery grounds are essential for healthy shark stocks as they provide young sharks with appropriate food and protection from larger sharks. Offshore Net and Line operators are very keen to have these nursery grounds identified as soon as possible.

OBJECTIVE 2

Ensure that the overall harvests of shark and Grey mackerel resources remain within sustainable biological limits.

Strategy

Ensure stock assessments are undertaken every five to seven years.

Review catch data annually.

Promote the regular assessment of non commercial catches.

Performance Indicator

Stock assessments undertaken.

Catch data reviewed.

Assessments undertaken and data reviewed.

OBJECTIVE 3

Minimise interactions with and impacts on non retained species.

Release of non retained species

Strategy

Wherever possible, set fishing gear where catch other than target species is minimised.

Performance Indicator

Good management practice in regard to the setting of fishing gear is adopted by all operators.

Strategy

Release any non commercial species as gently and quickly as possible.

Share information with other operators on areas in which increased levels of protected species are observed.

Performance Indicator

Non commercial catch released as per Code of Practice.

Increased communication between operators on areas with observed levels of protected species activity.

Background

Gillnets and longlines, used properly, are a very selective method for catching fish. Non commercial species taken in fishing gear mean unnecessary work for an operator to clear the gear. By-catch in nets also has the potential to damage targeted species, thus reducing quality. Less than 2 percent of the total catch from the fishery is by-catch and this is commonly made up of crabs, rays and trevally.

Avoid capture of protected species

Strategy

Check nets regularly, particularly in areas where protected species are more likely to be found.

Share information with other operators on areas in which increased levels of protected species are observed.

Performance Indicator

No, or minimal capture of protected species occurs.

Increased communication between operators on areas with observed levels of protected species activity.

Background

It is illegal to be in possession of protected species. While it is understood that accidental interactions do and will continue to occur occasionally, strategic fishing gear setting and constant observation during a fishing operation can minimise these. Documents on strategies of how to maximise the survival of protected species in an accidental interaction have been produced by the Seafood Council.

OBJECTIVE 4

Conduct environmental management in a transparent and cooperative manner with other key stakeholders.

Strategy

Annually review the progress, compliance and continuing relevance of the EMS at an Offshore Net and Line Licensee Committee General Meeting.

Produce an annual report on the status of the EMS and circulate to key stakeholders.

Advise of the annual EMS status report on the Northern Territory Seafood Council website.

Performance Indicator

Review completed at a General Meeting annually.

Production and circulation of an annual report.

Appropriate information posted on website.

Background

As the EMS is an ongoing process, it is important that a formal annual review mechanism is implemented and that both industry and the wider community are aware, and appreciate the value of, the EMS process in ensuring the responsible use of the community owned resource.

OBJECTIVE 5

Actively participate in fishery reviews, legislation development and resource management decision making forums.

Strategy

Ensure representatives of the Licensee Committee are present at all relevant forums.

Clearly identify and pursue management arrangements that enhance the ecological and economic viability of the fishery.

Performance Indicator

Licensee Committee represented in all relevant forums.

Appropriate arrangements are in place.

Background

The Offshore Net and Line Licensee Committee is represented on a number of advisory and decision making forums that directly impact on the Offshore Net and Line fishery. The Northern Territory Seafood Council represents licensee interests in a number of other forums which may impact on Offshore Net and Line fishery operators.

OBJECTIVE 6

Support research which enhances ecological sustainability, productivity, protection of the environment and the viability of fishing operations.

Strategy

Review the fishery's research priorities annually to ensure that projects are relevant and prioritised accordingly.

Ensure that research agreed to with DEH under export accreditation is carried out in a timely manner.

Provide assistance wherever possible to researchers on investigations in relation to the continued ecologically sustainable development of the Offshore Net and Line fishery.

Performance Indicator

Formal annual review of the relevance of research priorities and their potential management action outcomes.

Agreed research is undertaken.

Practical assistance provided by industry where necessary.

Background

Commercial Offshore Net and Line operators have made considerable contributions to target species research and monitoring programs. It is widely recognised by operators that their contributions to research and monitoring assist in providing a greater understanding of Northern Territory shark and Grey mackerel stocks. This increased understanding will assist in ensuring the Offshore Net and Line fishery remains ecologically sustainable.

OBJECTIVE 7

Minimise resource consumption, waste production and pollution associated with fishing operations.

Strategy

Retain all litter generated during fishing operations.

Maintain engines in optimum condition to minimise greenhouse gas emissions.

Performance Indicator

Litter disposed of at land facilities.

Engines maintained in optimum condition across fleet.

Strategy

Check refrigeration door seals on a weekly basis.

Install appropriate signage on vessels to remind crew to keep refrigeration equipment doors closed.

Use cleaning products aboard a vessel that are biodegradable.

Performance Indicator

Refrigeration seals maintained on all vessels.

Signage installed on refrigeration equipment.

Biodegradable chemicals are used

Background

Rubbish generated during a fishing trip should be retained onboard the vessel and disposed of on land at the end of the trip. Fish wastes are disposed of at sea and provide a food source for marine organisms. Disposal of plastics at sea is prohibited, as this can cause significant threats to marine life. Details on this matter are contained in the fishery's Code of Practice.

OBJECTIVE 8

Promote and participate in industry training and education opportunities in environmental awareness, conservation principles and good management practices.

Strategy

Identify areas in which industry training and education can be undertaken to improve environmental awareness and best practice.

Design and implement courses and strategies to ensure good environmental, conservation and management practices among people who work in the Offshore Net and Line fishery.

Identify key community education opportunities and utilise as many as possible on an ongoing basis.

Performance Indicator

Training areas identified.

Relevant courses and strategies designed, implemented and available on an ongoing basis.

Participation in key events that provide community education opportunities.

Background

Two key factors for the future of the Offshore Net and Line fishery are informed operators complying with management rules and a wider community which values the importance of the commercial fishery. There is an unacceptable amount of misinformation and lack of information about the fishery in the community generally which often adversely impacts on licensees. The turnover of staff in fishing operations is such that an ongoing introductory package for operating in the fishery is necessary.

OBJECTIVE 9

Comply with all relevant legislation.

Strategy

Develop a concise introductory package regarding legislation which can be provided to all new people working in the fishery.

Operators who witness illegal fishing activities to report them to Fishwatch on 1800 065 522.

Keep a register of charges for non-compliance and report results annually to the Licensee Committee.

Performance Indicator

Introductory package developed.

Timely reports of illegal fishing activities.

On going register kept.

Background

Non compliance with key regulations and management mechanisms not only reflects badly on fishery participants as a whole, but can have adverse effects on stocks at a local level. It is incumbent on all in the fishery to be aware of this and act accordingly during fishing operations.

OFFSHORE NET AND LINE EMS ANNUAL REPORT TEMPLATE

OBJECTIVE 1

Continue to protect the habitats which underpin the ecological health of the Offshore Net and Line fishery.

Strategy	Performance Indicator	Performance
Generally monitor and report, together with samples if possible, any unusual plants or animals observed in an area.	Timely reporting of unusual plants or animals that are detected.	
Report every sighting of foreign fishing vessels in Australian waters.	Timely reporting of foreign fishing vessel sightings.	
Monitor areas being worked for debris and other water pollution and report incidents to the Pollution Hotline, 1800 064 567.	Timely reporting of pollution incidents.	
Review marine pollution reports annually.	Reviewed annually.	
Continue to work with Fisheries research to identify shark nursery areas around the NT coast.	Nursery areas identified and appropriate management measures developed and implemented.	

OBJECTIVE 2

Ensure that the overall harvests of shark and Grey mackerel resources remain within sustainable biological limits.

Strategy	Performance Indicator	Performance
Ensure stock assessments are undertaken every five to seven years.	Stock assessments undertaken.	
Review catch data annually	Catch data reviewed.	

Promote the regular assessment of non commercial catches.	Assessments undertaken and data reviewed.	
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OBJECTIVE 3
Minimise interactions with and impacts on non retained species.

Strategy	Performance Indicator	Performance
Wherever possible, set fishing gear where catch other than target species is minimised.	Good management practice in regard to the setting of fishing gear is adopted by all operators.	
Release any non commercial species as gently and quickly as possible.	Non commercial catch released as per Code of Practice.	
Share information with other operators on areas in which increased levels of protected species are observed.	Increased communication between operators on areas with observed levels of protected species activity.	
Check nets regularly, particularly in areas where protected species are more likely to be found.	No, or minimal capture of protected species occurs.	
Share information with other operators on areas in which increased levels of protected species are observed.	Increased communication between operators on areas with observed levels of protected species activity.	

OBJECTIVE 4
Conduct environmental management in a transparent and co operative manner with other key stakeholders.

Strategy	Performance Indicator	Performance
Annually review the progress, compliance and continuing relevance of the EMS at an Offshore Net and Line Licensee Committee General Meeting.	Review completed at a General Meeting annually.	

Produce an annual report on the status of the EMS and circulate to key stakeholders.	Production and circulation of an annual report.	
Advise of the annual EMS status report on the Northern Territory Seafood Council website.	Appropriate information posted on website.	

OBJECTIVE 5

Actively participate in reviews, legislation development and resource management decision making forums that may impact on the Offshore Net and Line fishery.

Strategy	Performance Indicator	Performance
Ensure representatives of the Licensee Committee are present at all relevant forums.	Licensee Committee represented in all relevant forums.	
Clearly identify and pursue management arrangements that enhance the ecological and economic viability of the fishery.	Appropriate arrangements are in place.	

OBJECTIVE 6

Support and participate in research which enhances ecological sustainability, productivity, protection of the environment and the economic viability of harvesting operations.

Strategy	Performance Indicator	Performance
Review the fishery's research priorities annually to ensure that projects are relevant and prioritised accordingly.	Formal annual review of the relevance of research priorities and their potential management action outcomes.	
Ensure that research agreed to with DEH under export accreditation is carried out in a timely manner.	Agreed research is undertaken.	

Provide assistance wherever possible to researchers on investigations in relation to the continued ecologically sustainable development of the Offshore Net and Line fishery.	Practical assistance provided by industry where necessary.	
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OBJECTIVE 7
Optimise energy consumption and minimise waste production and pollution associated with fishing operations.

Strategy	Performance Indicator	Performance
Retain all litter generated during fishing operations.	Litter disposed of at land facilities.	
Maintain engines in optimum condition to minimise greenhouse gas emissions.	Engines maintained in optimum condition across fleet.	
Check refrigeration door seals on a weekly basis.	Refrigeration seals maintained on all vessels.	
Install appropriate signage on vessels to remind crew to keep refrigeration equipment doors closed	Signage installed on refrigeration equipment.	
Use cleaning products aboard a vessel that are biodegradable.	Biodegradable chemicals are used.	

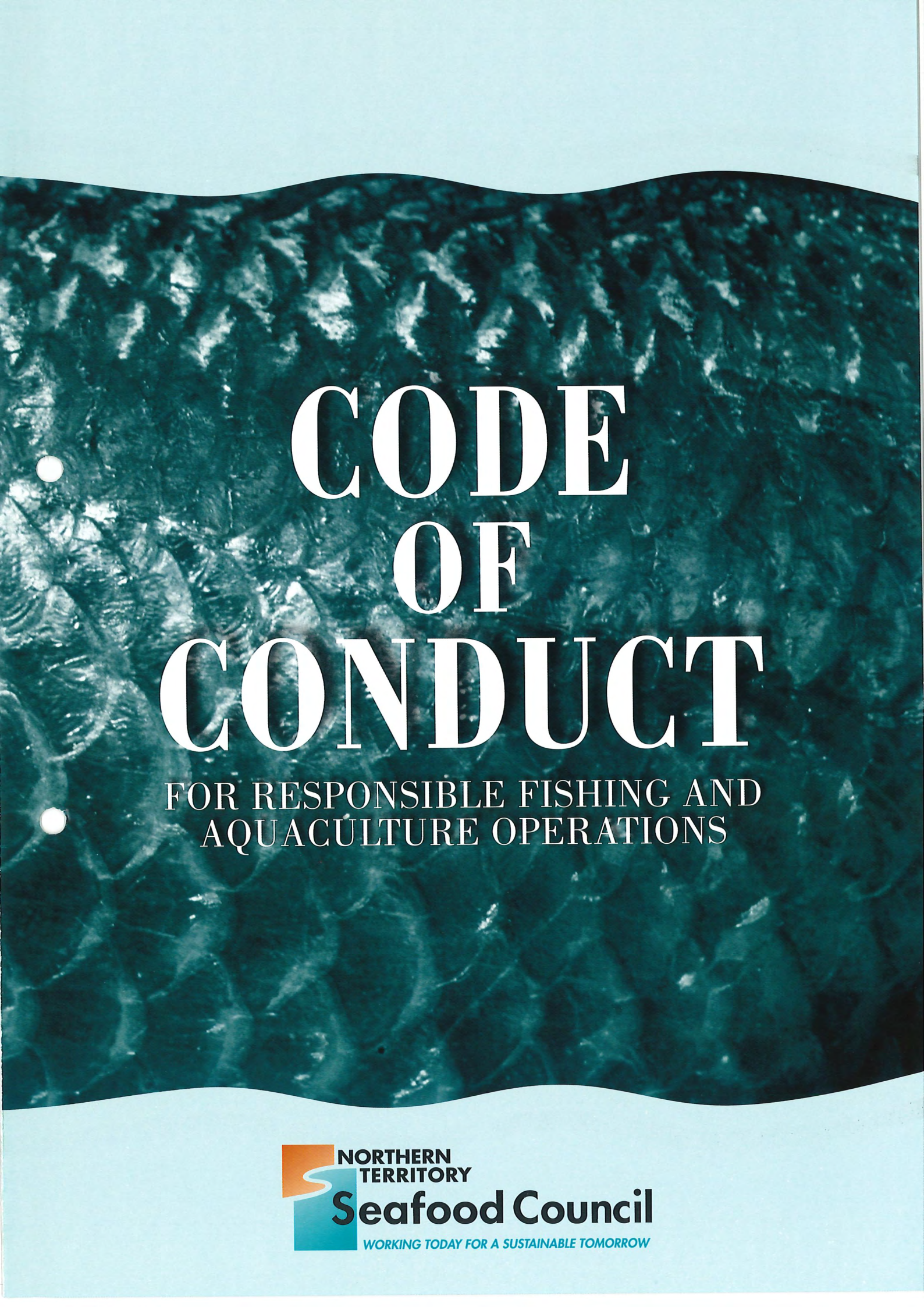
OBJECTIVE 8
Promote and participate in industry training and education opportunities in environmental awareness, conservation principles and good management practices.

Strategy	Performance Indicator	Performance
Identify areas in which industry training and education can be undertaken to improve environmental awareness and best practice.	Training areas identified	

Design and implement courses and strategies to ensure good environmental, conservation and management practices among people who work in the Offshore Net and Line fishery.	Relevant courses and strategies designed, implemented and available on an ongoing basis.	
Identify key community education opportunities and utilise as many as possible on an ongoing basis.	Participation in key events that provide community education opportunities.	

OBJECTIVE 9
Comply with all relevant legislation.

Strategy	Performance Indicator	Performance
Develop a concise introductory package regarding legislation which can be provided to all new people working in the fishery.	Introductory package developed.	
Operators who witness illegal fishing activities to report them to Fishwatch on 1800 065 522.	Timely reports of illegal fishing activities.	
Keep a register of charges for non-compliance in the fishery and report results annually to the Committee.	On going register kept.	



CODE OF CONDUCT

FOR RESPONSIBLE FISHING AND
AQUACULTURE OPERATIONS

CODE OF CONDUCT

The Northern Territory seafood industry understands and accepts its responsibility and accountability to conduct operations in a manner that continues to ensure resource sustainability, ecological integrity and economic viability.

This Code of Conduct specifies the principles and behaviour that industry participants commit to adhere to.

Environment

- Ensure that operations are conducted in accordance with Northern Territory and Commonwealth laws and regulations, as well as with international laws, regulations, conventions, declarations and protocols adopted by Australia
- Take all reasonable measures to minimise impacts of their operational activities on the environment

Interactions with other user groups

- Acknowledgment of and respect for the rights of all other resource users, land holders and land owners when carrying out operations
- Positive promotion of harmonious relations with other resource users, land holders and land owners

Y SEAFOOD INDUSTRY

Ecological Sustainability

- Take appropriate measures to ensure fisheries continue to be harvested and utilised to maintain the sustainable use of Northern Territory aquatic resources
- Promotion and utilisation of new technologies and techniques which enhance sustainable fishing practices
- Continue to minimise impacts on non target species during fishing operations

Research

- Support for research, including active participation where possible, which enhances ecological sustainability, productivity, protection of the environment and the viability of industry operations

Conservation

- Acknowledgment that conservation is a shared responsibility and requires a spirit of cooperation among all industry participants, appropriate regulatory authorities and other key stakeholder groups

Resource Management

- Actively participate in reviews, development of legislation and more detailed resource management decision making forums

Education

- Promotion of and, when appropriate, participation in both specialised industry training and education opportunities in environmental awareness, conservation principles, occupational health and safety matters and good management practices

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For more information:

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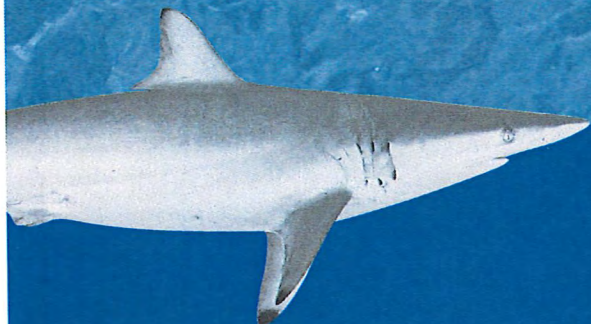
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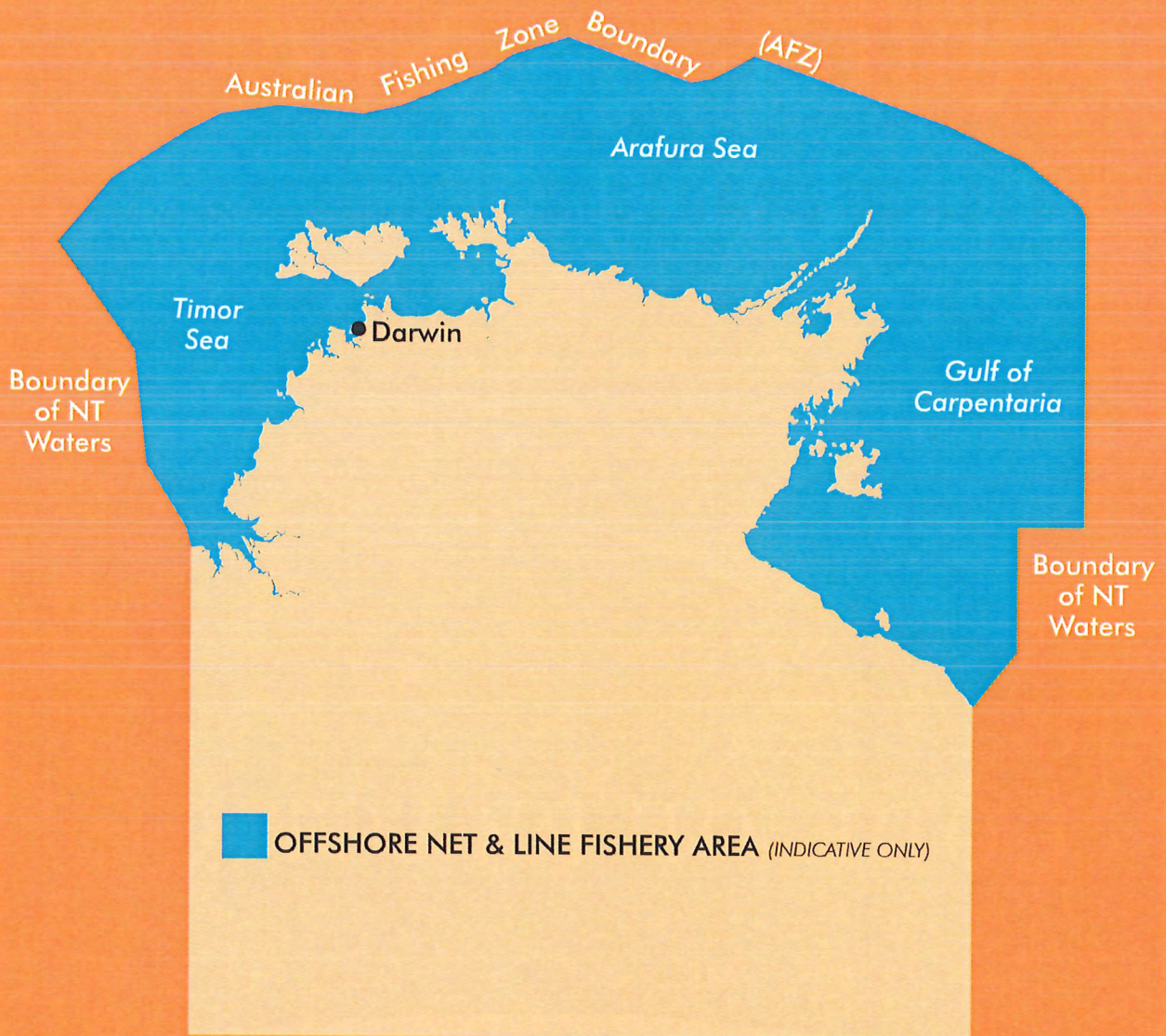
NORTHERN TERRITORY

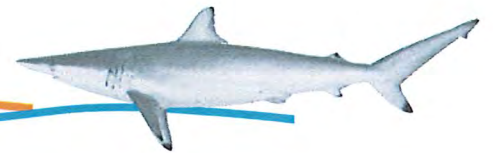
Offshore Net
and Line *Fishery*



CODE OF PRACTICE

OFFSHORE NET AND LINE FISHERY





OBJECTIVE

To provide operators in the Northern Territory Offshore Net and Line fishery with the knowledge and understanding to further enhance the ecological sustainability of the fishery and safety of operations, while maximising the quality, safety and value of product.

INTRODUCTION

A best practice guide for the Offshore Net and Line fishery, this is specifically designed to assist operators to maximise the quality and value of product, minimise wastage and contribute to the ongoing ecological and economic health of the Offshore Net and Line fishery and businesses involved in it.

This voluntary Code of Practice has been developed by the Offshore Net and Line Licensee Committee of the Northern Territory Seafood Council, with funding assistance from the Fisheries Research and Development Corporation and the Northern Territory Government.

THE FISHERY

The Offshore Net and Line fishery extends from the high water mark at the coast to the outer boundary of the Australian Fishing Zone, between the Western Australian and Queensland maritime borders.

The fishery is managed by the Northern Territory under NT law through a Joint Authority comprising the Northern Territory and Commonwealth Governments.

It is a low participant fishery with input and output controls that reflect the conservative management regime.

Two harvesting methods are permitted, pelagic netting and pelagic and demersal longlining. Netting is the most common method.

The fishery's main target species are Blacktip shark (*Carcharinus tilstoni*, *C. sorrah*) and Grey mackerel (*Scomberomorus semifasciatus*), with a variety of other sharks and pelagic finfish also landed.

The fishery is a significant contributor to the Northern Territory economy.





PREPARATION

Vessels

Good vessel design and maintenance minimise the chance of contamination and physical damage to the product.

Gear

Gear should be designed to minimise damage or loss of product. All gear used in the fishing operation should be maintained and stowed or secured in a safe manner when not in use.

Occupational health and safety

It is important that clear occupational health and safety guidelines are in place for the entire fishing operation and that crew members understand these and other relevant food safety and regulatory obligations.

Wearing appropriate clothing and footwear, avoiding loose clothing and securing long hair are wise precautions.

When crew understand their responsibilities during fishing operations the chances of accidents are minimised.

Hygienic handling

Crew should be trained in the hygienic handling of food products.

Any person with a contagious or notifiable illness must not be allowed to come in to contact with product unless the integrity of the product can be guaranteed.

Secure harmful materials

Harmful and poisonous materials such as oils, insecticides and cleaning products must be stored and/or secured in an area where they cannot contaminate fish product or handling areas.

Pest control

Rodents, birds and insects are all potential carriers of diseases which could contaminate product and it is important that adequate steps are taken to control pests on a vessel. Domestic animals should not be kept onboard.

Cleaning

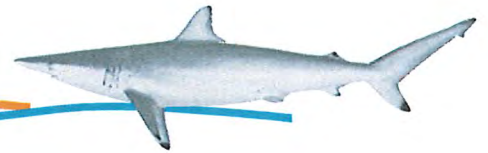
Deck, mats, processing tables, fish bins, iceboxes, utensils and other potential fish contact surfaces should be cleaned and sanitised to prevent any contamination.

Ensure only "food safe" cleaning and sanitising products are used on product surfaces and always follow manufacturers directions in respect to their use.

Chilling and freezing facilities

If ice is used, sufficient supplies for both fish packing and storage should be taken onboard and equipment used during processing, handling or storage of ice should be clean.

Check brine tanks and refrigeration equipment prior to departure to ensure they are in working order.



HARVESTING

Shooting the net

Netting is normally carried out at night as the target species rise to the upper level of the water column to feed. Shooting speed should be such that crew can adequately and safely attach floats, etc, where required.



Net soak time

The net should remain in the water no longer than three hours. This will ensure that the quality of the catch is maintained.

Hauling the net

The net should be hauled onto the vessel at a speed which allows the safe removal of all catch. Damaged or lost product is also lost income.

Shooting the line

Ensure that sinkers are placed on the shooter table before they are clipped to the main line.

When clipping hooks on the main line, make sure that the baited hook is thrown into the water first to avoid potential accidents.

Line soak time

Keeping line soak time to a minimum will maximize product value. Soak time will differ with each shot, depending on the number of hooks used and other variables.

Retrieval of line

If winching speed is too fast fish can be damaged or lost, meaning lost income. Fish should be removed from hooks and processed as quickly as possible. Care should be taken when unclipping hooks and weights, as these processes can be potentially dangerous if not conducted properly.

Handle fish gently

Each time fish are handled there is potential for damage, so they should always be handled gently and a minimum number of times. Fish should not be placed on hot, dry surfaces and should also be protected from the drying effects of the sun and wind.



By-catch

Fishing in areas where a high incidence of by-catch or protected species is known should be avoided. While by-catch in the



fishery is very low, all attempts should be made to quickly release non retained animals alive with the minimum of stress and injury. Handling fish gently with wet hands or gloves will assist in minimising damage.

PROCESSING

Handle fish with clean hands

Before handling or processing catch, crew members should ensure their hands are clean. If gloves are used they should be clean and rinsed regularly during processing. After use they should be cleaned and dried.

Processing surfaces and implements

Processing surfaces should be cleaned of waste, washed down and rendered sterile at the end of each processing run. During the run, regular rinsing off with clean seawater will also lessen the risk of contamination.

Smoking, eating and drinking should be prohibited in the processing, sorting and storage facility areas.

Water

Using only clean sea water or potable fresh water on product will maintain its safety and quality.

Seawater from polluted waters should not be used on product surfaces or containers.

Dispatch in a timely and humane manner

Dispatching the fish as soon as possible may delay the onset of rigor and increase shelf life. Sharks can be effectively dispatched by a

forceful blow to the top and rear of the head, or by cutting through the vertebrate between the head and dorsal fin to sever the spinal cord.

Bleeding

Fish that require bleeding should be bled quickly with a sharp knife and immersed in an ice slurry as soon as possible. The most effective way to bleed shark is to sever the lower tail fin.

Running clean water over the fish during bleeding will assist in keeping the fish cool and wash away the blood.



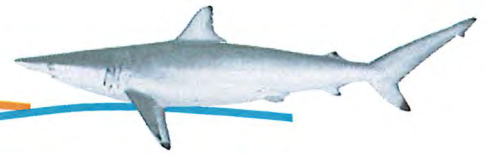
Chill fish as soon as possible

Delays in chilling the fish will adversely impact on product quality and safety.

Maintaining the cold chain throughout processing will assist in maintaining a high quality product.

Monitor brine tank temperature

Brine tank temperature should be between -1°C and $+4^{\circ}\text{C}$ and monitored regularly. Fish to be sold as fresh should not at any



stage reach a temperature below -1°C as partial freezing may occur.

Fish should be packed in the brine tank in a manner capable of lowering the core temperature of product to below 4°C as quickly as possible.

Avoid leaving fish in the brine too long

Leaving whole fish in the brine too long may cause unsightly appearance, including a loss of colour, which can potentially lessen fish value. After the temperature of fish has been reduced, remove them from the brine tank and process as soon as possible.

Change brine or slurry regularly

Only clean water should be used in brine tanks and it should be changed as required.

Removing viscera

Fish viscera contains digestive enzymes and micro-organisms and if not completely removed, may aid spoilage of product. Similarly, removed viscera should not come into contact with other fish.

Keep the deck clean

The vessel's deck should be continually washed down to remove any contaminants and to maintain a safe working environment.

Product utilisation

While markets and physical conditions during harvesting are factors, every effort should be made to maximise the utilisation of product.

Operators are encouraged to explore new markets for products.

It is also important to adhere to the agreed mandatory fin to meat ratios for shark on the vessel as these measures, which have the support of the industry, are in the best interests of everyone involved in the fishery and the continuing ecological sustainability of target and by-catch species.



PACKING & STORAGE

Use food grade packaging

Packaging used for product must be of food grade quality and stored in a contaminant and pest free environment.

Packing product

Pack product straight and with care. Do not straighten fish bent stiff with rigor, as this will tear the tissue.

Regularly check the accuracy of weights

To ensure packages contain correct weights of product, scales should be regularly checked for accuracy. Check weights should be available onboard and used at the beginning, at least, of each processing session.



Minimise transfer time from the brine or slurry to storage

Processing product in small batches will minimise the transfer time between brine and storage and will assist in maintaining the cold chain.

Regularly check thermometers

Fish quality and safety is dependent on temperature control and thermometers should be regularly checked for accuracy. A check thermometer should be available onboard and used at the beginning, at least, of each processing session.

Check trunks for ammoniation

Storing ammoniated trunks with high-quality trunks should be avoided, as the former can lead to contamination of the latter. Ammoniated trunks are readily identified by the strong smell of ammonia that emanates from them.

Chilled storage

Whole fish should be soldier packed, with each layer of fish covered in ice. Regular visual inspections are required to ensure adequate ice coverage. Re-ice the fish as necessary and continually remove melt water.

Care must be taken when storing fish to prevent crushing.

Frozen storage

Ensure cartons are lined with a suitable plastic liner, such as 35 micron low density plastic. Pack fillets with plastic food grade sheets between each layer.

Ensure fish are protected from freezer burn

Trunks and fillets should be protected from dry freezer air. Exposed fish flesh will quickly suffer freezer burn, which will lower the quality of product.

Monitor freezer gauges

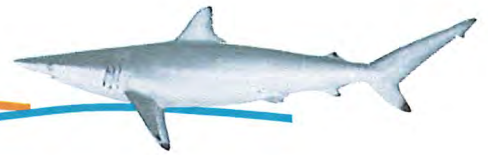
It is good practice to monitor freezer temperature three or four times daily. Frozen product must be kept at or below -18°C at all times and it is recommended that freezers be fitted with high temperature alarms.

TRANSPORT

It is important to ensure that the cold chain is maintained during unloading and transport to storage or market to ensure temperatures do not rise above the minimum recommended for frozen (-18°C) or move outside the chilled range (-1°C and $+4^{\circ}\text{C}$) as appropriate.

Transferring product from onboard storage in small batches to the receiving unit which in turn, should be pre-chilled, will help ensure integrity of the cold chain.

All deck equipment and holding tanks should be thoroughly cleaned, disinfected and rinsed following unloading.



WASTE & POLLUTION

Fish waste

By removing processing waste as soon as practical, the risk of contaminating product is reduced.

Discarding waste within enclosed waters such as harbours and in the vicinity of communities should be avoided. Fish waste should be discarded on the opposite side of the vessel to the deck hose intake and where gear is being hauled.

Plastics

Plastics are not allowed to be discharged into the sea. All plastics must be retained on the vessel and disposed of at port facilities. Plastic waste which forms a continuous loop should be cut onboard to minimise impacts in the event that it is accidentally lost at sea.

Noxious liquids

No discharge of residues containing noxious substances is permitted within 12 nautical miles of the nearest land. The discharge of liquid in quantities or concentrations that are harmful to the aquatic environment is prohibited by law.

Garbage

Non-plastic garbage which cannot be retained onboard for proper disposal ashore may, by law, only be disposed of at sea provided the vessels is more than 12 nautical miles from the nearest land.

Oil and oily mixtures

The law does not allow oils or oily mixtures to be discharged into the sea. Waste oil and oily residues must be stored onboard for disposal at port waste disposal facilities.

Retrieval of lost fishing gear and garbage

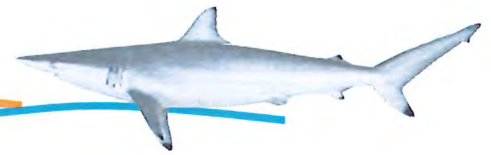
Lost fishing gear and garbage can pose a significant threat to aquatic life. All efforts should be made to retrieve lost fishing gear. If it is not possible to collect, report the location of the gear to the relevant authorities.

Efforts should also be made to retrieve any non-degradable garbage or wastes found during fishing operations for proper disposal at onshore facilities.

Report pollution

Any oil or chemical spills or other incidences of environmental damage in the area of the fishery should be reported as follows:

- Within 3nm, to the **Pollution Hotline 1800 064 567**
- Beyond 3nm, to the **Rescue Co-ordination Centre Australia** phone **1800 641 792** or fax **1800 622 153**



THREATENED SPECIES

There are a number of species listed as protected under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and under the Northern Territory's *Territory Parks and Wildlife Conservation Act*.

On occasions, unintended interactions with protected species may occur. It is a legal requirement to report any such interactions to the Australian Government Department of the Environment and Heritage.

Some examples of interactions that require reporting are:

- Any action resulting in the killing, injuring, taking or trading of a listed species
- The accidental capture of a listed species in a fishing operation
- A humane action that is necessary to relieve or prevent the suffering of a listed species
- An action taken to prevent risk to human health
- An action that is necessary to deal with an emergency where there is a serious threat to human life or property

Reporting requirements

Under the EPBC Act, the Department of the Environment and Heritage (DEH) must be notified within 7 days of a person becoming aware of an interaction and the report should include the following details:

- Time and date
- Species involved
- Number of animals
- Specific location
- Gear or bait type used

The following are protected species listed in Territory and/or Commonwealth legislation.

Common Name	Scientific Name
Speartooth Shark*	<i>Glyphis sp. A</i>
Northern River Shark*	<i>Glyphis sp. C</i>
Loggerhead Turtle*	<i>Caretta caretta</i>
Green Turtle*	<i>Chelonia mydas</i>
Leatherback Turtle*	<i>Dermochelys coriacea</i>
Hawksbill Turtle*	<i>Eretmochelys imbricata</i>
Flatback Turtle*	<i>Natator depressus</i>
All cetaceans (whales & dolphins)	Cetacea
Freshwater Sawfish*	<i>Pristis microdon</i>
Dwarf Sawfish	<i>Pristis clavata</i>
Green Sawfish	<i>Pristis zijsron</i>
Narrow Sawfish	<i>Anoxypristis cuspidata</i>

* Interaction should be reported to DEH within 7 days

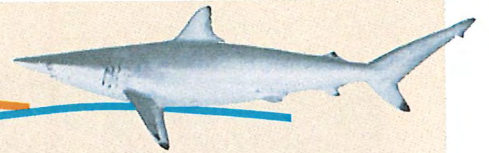
To report an interaction or to seek further information:

Phone: 1800 641 806

Email: protected.species@deh.gov.au

Mail: Director, Wildlife Impact and Protection Section
Dept. Environment & Heritage
GPO Box 787
Canberra ACT 2601

Internal photos courtesy of Damien Trinder – Pelagicus Pty Ltd.



DEFINITIONS

By-Product – Catch which is kept to be sold but is not the principal target.

By-Catch – Catch which is returned to the sea either because it has little or no commercial value or because regulations preclude it being retained.

Ecologically Sustainable Development – Using, conserving and enhancing community resources so that ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased

CONTACTS

Australian Maritime Safety Authority (AMSA)

Queries regarding Commonwealth environmental laws.

Tel: 02 6279 5015 | Fax: 02 6279 5966

CSIRO

Enquiries and reporting of tagged fish

Tel: 1300 363 400

Bureau of Meteorology

Forecasts and warnings Tel: 08 8920 3826

General Enquires Tel: 08 8920 3800

Department of the Environment and Heritage (DEH)

Reporting all listed species interactions.

Tel: 1800 641 806

Fishwatch

Reporting illegal fishing activities

Tel: 1800 065 522

Museum and Art Gallery of the Northern Territory

Identification of unusual or exotic fish

Tel: 08 8999 8201

NT Fisheries

Fisheries Management Agency

Tel: 08 8999 2144 | Fax: 08 8999 2065

NT Parks and Wildlife Commission

Interactions with tagged animals and protected species.

Tel: 08 8999 5511

NT Pollution Hotline

Reporting pollution within the NT

Tel: 1800 064 567

Northern Territory Seafood Council

Peak industry body, NT

Tel: 08 8981 5194 | Fax: 08 8981 5063

Offshore Net and Line Licensee Committee

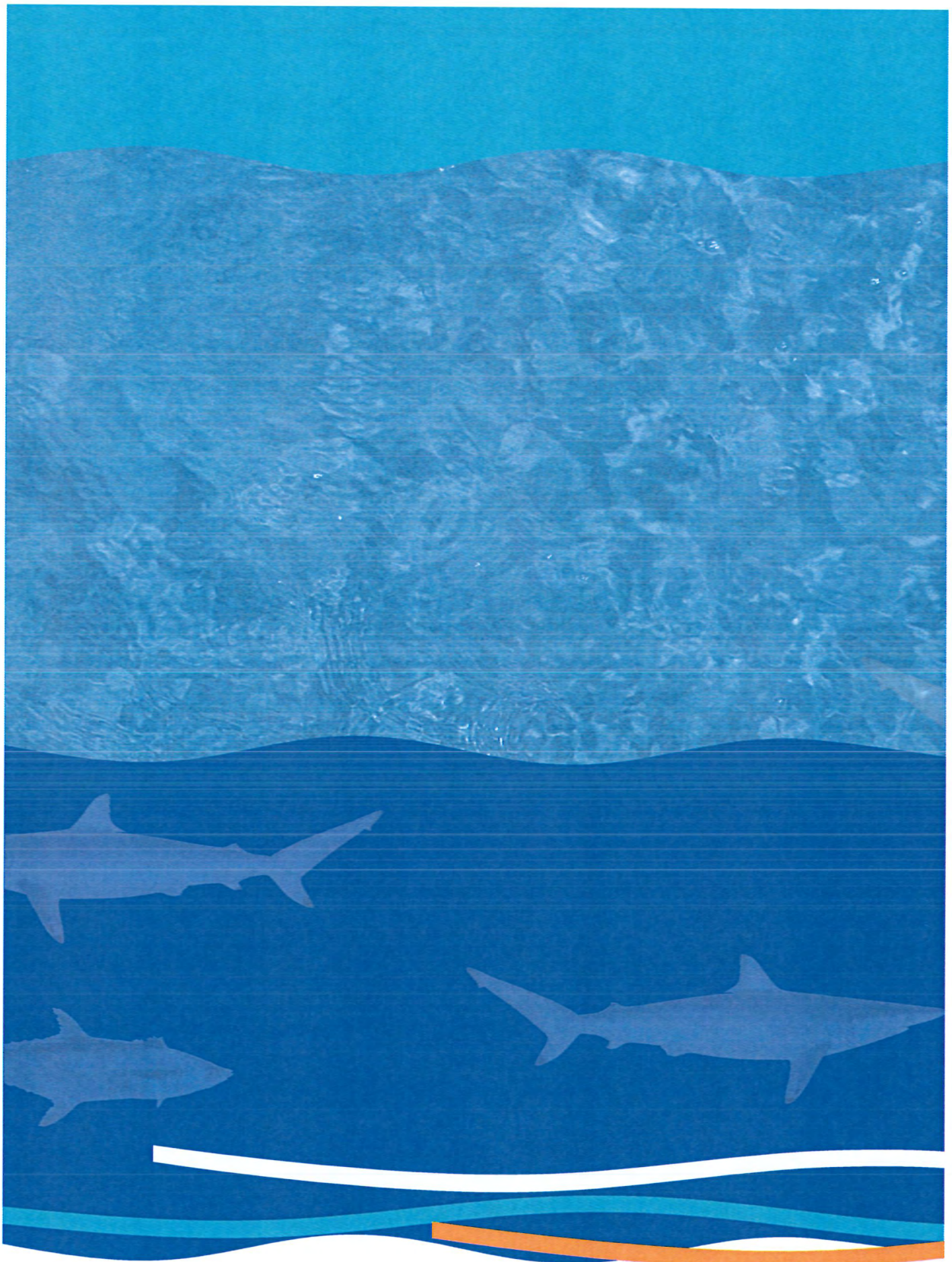
Industry representative

Tel: 08 8981 5194 | Fax: 08 8981 5063

Rescue Co-ordination Centre Australia (RCC Australia)

Reporting close collisions and pollution at sea beyond 3nm.

Tel: 1800 641 792 | Fax 1800 622 153



For more information:
Northern Territory Seafood Council
Offshore Net and Line Licensee Committee
Tel 08 8981 5194
www.ntsc.com.au | ntsc@ntsc.com.au
GPO Box 618 Darwin NT 0801

**PROTECTED
SPECIES
AWARENESS
INFORMATION
FOR
PROFESSIONAL FISHING OPERATIONS**

**MARINE
TURTLES**

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**Produced by the
Northern Territory Seafood Council**

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Darwin NT 0801**

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ISSUES INVOLVED WITH PROTECTED TURTLE SPECIES IN THE NORTHERN TERRITORY

Of the seven marine turtle species in the world, six occur in Northern Territory waters. All six species are protected under Commonwealth and Northern Territory law. The six species are the Flatback turtle (*Natator depressus*), Green turtle (*Chelonia mydas*), Hawksbill turtle (*Eretmochelys imbricata*), Leatherback turtle (*Dermochelys coriacea*), Loggerhead turtle (*Caretta caretta*) and the Olive Ridley turtle (*Lepidochelys olivacea*).



DESCRIPTION

Marine turtles are relatively fast swimmers and are capable of migrating long distances between feeding grounds and nesting sites. They feed on a variety of marine animals and plants, with each species having its own specific feeding habits. The range of foods marine turtles may feed on include sea cucumbers, soft corals, jellyfish, molluscs, echinoderms, gastropods, prawns and crabs. Young turtles feed mostly on zooplankton. The adult Green turtle is the only species which is primarily herbivorous, feeding mostly on seaweed and seagrasses.

Their body, apart from the protruding limbs, tail and head, is protected by large shells. The upper part is called a carapace and the lower part a plastron. Outside these they have four strong, paddle-like flippers which aids the turtle in swimming and movement on land. Like other reptiles, they have lungs for

breathing air. Marine turtles typically have a beak-like mouth which is used to shear or crush food.

REPRODUCTION

Turtles take between 30 and 50 years to reach sexual maturity and then breed periodically for decades. Breeding of the Leatherback, Green, Hawksbill, Olive Ridley and Flatback turtle is known to occur in the Northern Territory. Mating typically occurs at night in water near the nesting beach. Females come ashore following mating and dig a hole for the eggs to be laid in. The round, soft shelled eggs are laid in the hole and gently covered with sand. The female will then disguise the nest and return to the sea. Although females have the capacity to lay hundreds of eggs in a nesting season, only a few young will survive their first year of life.



DISTRIBUTION AND HABITAT

Of the six protected turtles which occur in the Northern Territory, five occur globally. However, the Flatback turtle is primarily found in, and only breeds in, northern Australian waters. Important turtle habitats include coral reefs, seagrass beds, mangrove forests and nesting beaches. They spend most of their life in their feeding grounds, but periodically move up to hundreds of kilometres to their breeding grounds to mate and lay eggs. The males return to their feeding grounds after mating while the females remain at their breeding grounds to lay one to five clutches of eggs at approximately two weekly intervals before they too then return to their feeding grounds.

VULNERABILITY OF SPECIES

Marine turtles are recognised internationally as a species of concern. Humans can have significant impacts on both nesting grounds and their marine habitat. Alterations to beaches, including artificial lighting and beach cleaning, can reduce the survival of eggs and hatchlings. Turtles are also under threat from wastes such as plastic bags which a turtle may mistake for jellyfish and derelict fishing nets which turtles attempt to use as shelter, often leading to them becoming entangled. They are also threatened by habitat destruction, poor water quality and seagrass depletion. In the Northern Territory the harvesting of eggs and adults by Aboriginal people is recognised as a traditional practice.

At sea turtles are subject to predation by other predatory marine animals such as sharks, crocodiles, large cod and groupers. On land, turtle eggs and hatchlings are subject to predation by foxes, feral pigs, dogs, birds and goannas.

Turtles are also accidentally killed through collisions with boats or propellers as well as accidentally captured and/or drowned in professional fishing gear.



TURTLES AND FISHING GEAR

Turtles breathe air and must come to surface regularly. If a turtle is entangled by net, line or hook underwater and is unable to surface and breathe, it is likely to drown. The length of time a turtle can stay submerged varies within

each species. Prolonged struggling trying to free itself from fishing gear will shorten the overall time it can remain under water.

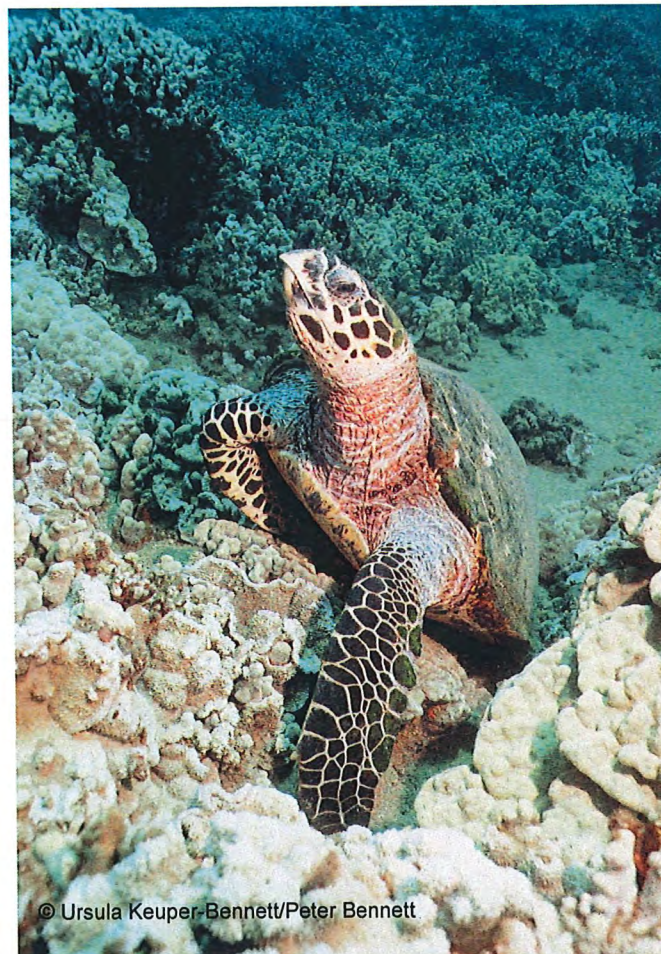
BEST PRACTICE IN USE OF FISHING GEAR

It is important that all practical measures are taken to increase the chances of survival for entangled or hooked turtles. Consideration should be given to the amount of gear set in areas where turtles are frequently spotted.

When hauling fishing gear, scan the gear as far out as possible during retrieval to identify any potential turtles caught. If a turtle is sighted in the gear, reduce the hauling speed and adjust the vessel direction to reduce the tension on the fishing net or main line while bringing the turtle closer to the vessel.

If using longlines, where possible use a circle hook, which is rounder and has smaller opening, as is has been shown to reduce the number of turtle interactions when compared to the common J-shaped hook.

De-hookers and dip nets should be should be onboard a vessel to assist in the retrieval and successful de-hooking of hooked turtles. All trawlers must be fitted with a Turtle Exculsion Devices (TED's).



HANDLING TURTLES

Sea turtles pose a risk to the safety of crew members and should be handled with care at all times. Restrain landed turtles in a safe place out of the sun to prevent interactions with crew and avoid further injury to the turtle onboard the vessel.

Turtles should not be dropped on the deck as this may cause damage to the turtle and possibly result in death.

RELEASING TURTLES

Once the turtle is landed and removed from fishing gear, observe the turtle to determine whether it is active or inactive. If an inactive turtle is returned to the water, without adequate recovery, it may drown.

If active (moving strongly and breathing regularly)

Gently return the turtle to the water after 15 minutes if possible;

- head first
- with the vessel stopped
- ensure fishing nets are not in operation

If not active

Keep the turtle on board;

- raise the rear end of the turtle about 20 centimetres off the deck by placing something under the turtle (to drain its lungs)
- keep it shaded and damp
- allow to recover for up to 24 hours

If the turtle doesn't become active, its probably dead and must be returned to the water

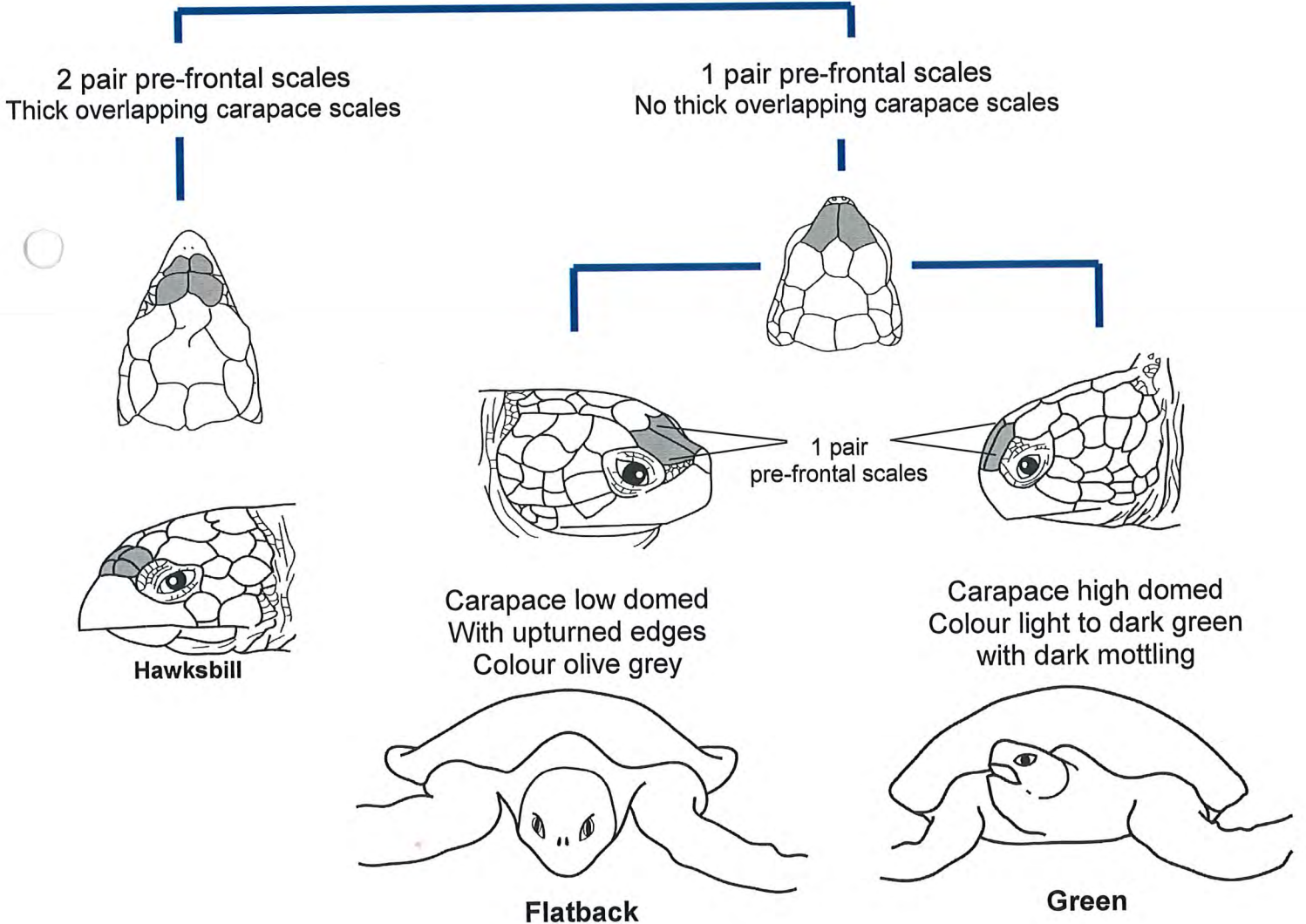
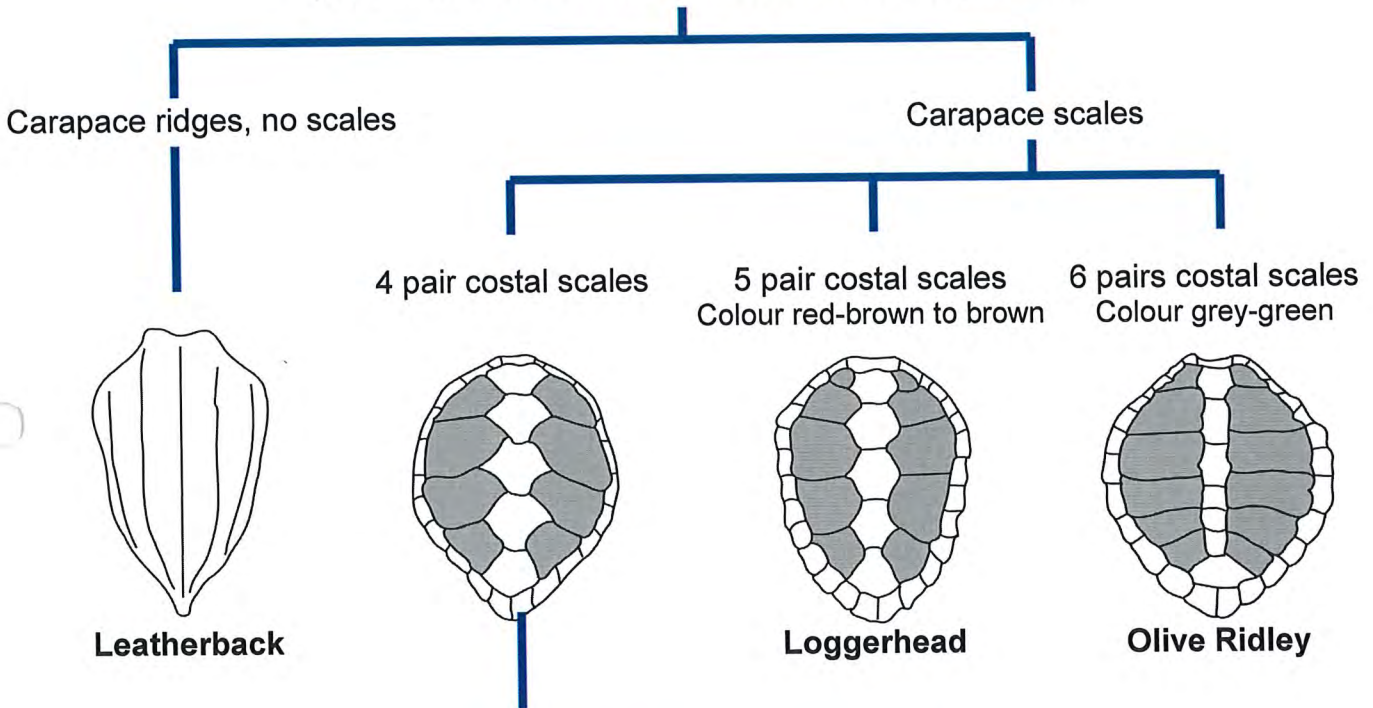
REPORTING INTERACTIONS

Professional fisherman can be an important source of information and observations on turtles. Direct interactions allow for species identification, size records and other information on turtles to be monitored over time. All interactions should be accurately recorded on log returns.

Records should include the date of interaction, species of turtle, length of the turtle shell, location, whether the turtle was released alive or dead and any tag numbers on tagged turtles.

IDENTIFICATION KEY

The identification key below will help you identify the marine turtles found within the Northern Territory. Follow the flow chart and match the carapace (shell) and/or the pre-frontal scales on the head to the turtle in question.



**PROTECTED
SPECIES
AWARENESS
INFORMATION
FOR
PROFESSIONAL FISHING OPERATIONS**

SAWFISH



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**Produced by the
Northern Territory Seafood Council**

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ISSUES INVOLVED WITH PROTECTED SAWFISH SPECIES IN THE NORTHERN TERRITORY

Within the Northern Territory there are four species of sawfish currently protected by either Commonwealth or Northern Territory legislation. These are the Freshwater sawfish (*Pristis microdon*), Dwarf sawfish (*Pristis clavata*), Green sawfish (*Pristis zijsron*) and Narrow sawfish (*Anoxypristis cuspidata*).



DESCRIPTION

Sawfish are modified rays which have shark like bodies, which are sometimes confused with sawsharks. Sawfish are distinguished by gill openings on the underside of their flattened head and an elongated blade-like snout bearing pairs of lateral teeth.

The snout can be used to feed by stunning slow moving shoal fish with sideswipes or by dislodging and locating molluscs and small crustaceans by sweeping through sand and mud. Sawfish can grow up to 7 metres in length and have an estimated lifespan of 20 to 30 years.

REPRODUCTION

It is believed that sawfish reach sexual maturity at approximately 10 years. Sawfish are born approximately 5 months after copulation and are approximately half a metre in length at birth, litter sizes ranging between 1 and 12. When the young sawfish are born, their snouts are flexible and covered in a sheath of fibrous tissues. Once born their snouts harden and the fibrous tissues wear away.

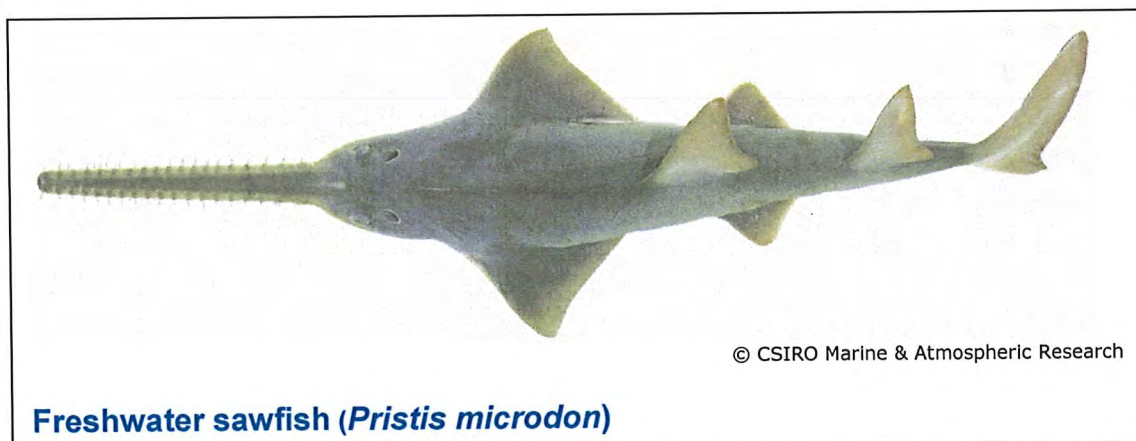
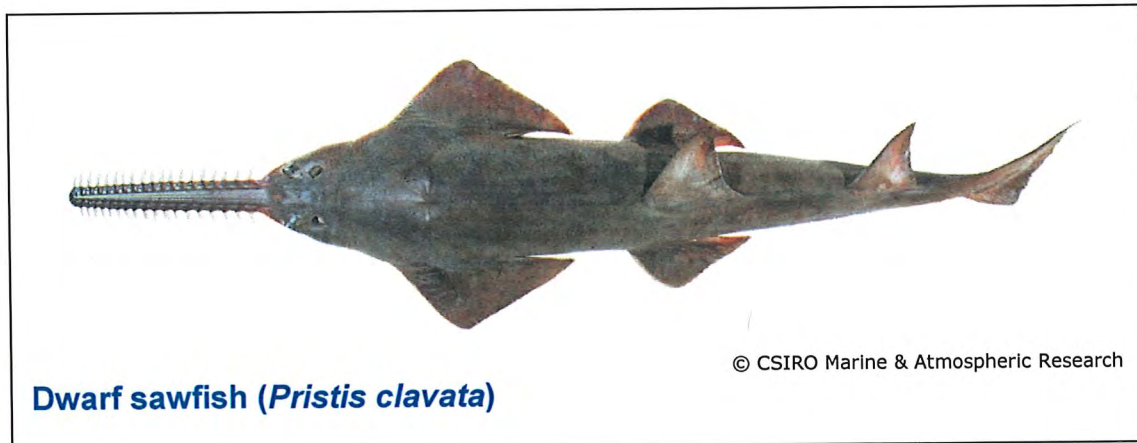
DISTRIBUTION AND HABITAT

Sawfish are distributed globally with four species found within the Northern Territory in coastal waters both fresh and marine. They generally inhabit shallow coastal and freshwater habitats in the tropical and sub tropical regions.

Distribution data is scarce, but they have been sighted in various regions throughout the Northern Territory.

VULNERABILITY OF SPECIES

Sawfish are targeted in some countries for their fins, flesh and other body parts. The loss of important habitats such as soft bottom areas which sawfish use for feeding and breeding also poses a threat. A further threat to sawfish is entanglement in fishing nets, as their snout is easily caught in net mesh.



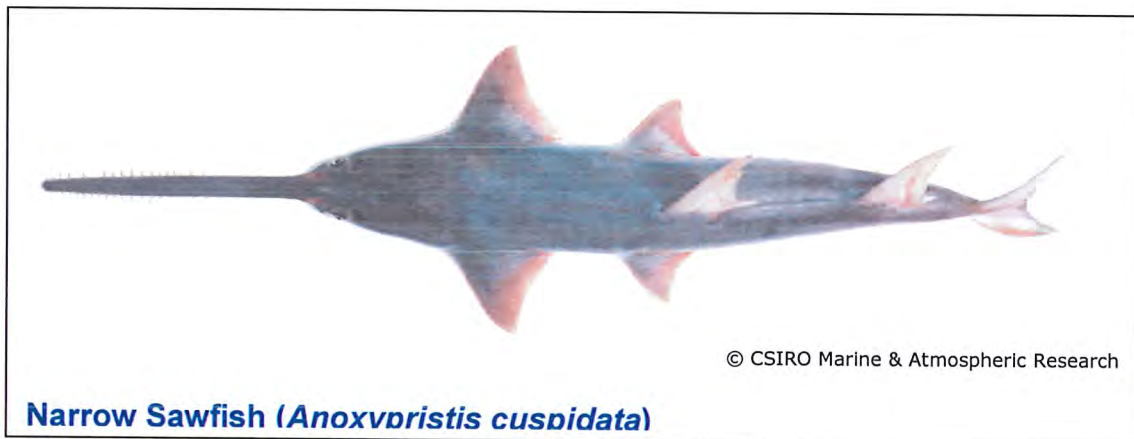
SAWFISH AND NETS

If a sawfish swims into a net, in most cases it will initially become entangled with netting around its snout. The natural reaction is to thrash around to free itself and this struggling can lead to further entanglement. If the sawfish is entangled underwater and is unable to surface and breathe, it is likely to drown.

BEST PRACTICE IN USE OF FISHING GEAR

It is important that all practical measures are taken to increase the chances of survival for entangled sawfish.

Consideration should be given to the amount of net set in areas where sawfish are frequently spotted. The amount of net should be limited to that which can be adequately patrolled during the particular set.



FREEING LIVE SAWFISH FROM NETS

A threatened sawfish may defend itself using its snout to strike from side to side with considerable force. Because of this, human safety should be a major consideration when handling sawfish of any size.

Once it has been established that a sawfish is caught in a net, attempts should be made to raise the animal's head out of the water to see the extent of entanglement. It will also allow the animal to breathe if it has been underwater. If possible, the animal's head should be kept out of the water to prevent it from drowning, but also to allow access to the net to cut the animal loose. A knife tied to a long pole or stick is useful to cut net while maintaining a safe distance from the sawfish.

EXTRACTING A DEAD ACCIDENTALLY CAPTURED SAWFISH

Sawfish may become exhausted after extensive struggling and in such cases may show no movement or clear external signs of life. Ensure the sawfish is dead before handling it at close quarters.

Under Northern Territory legislation it is an offence to be in possession of a sawfish or any part thereof without an appropriate permit from the Parks and Wildlife Service of the NT.

Where a sawfish is accidentally killed in nets, fishermen should ensure that the carcass is released into the water without interference.

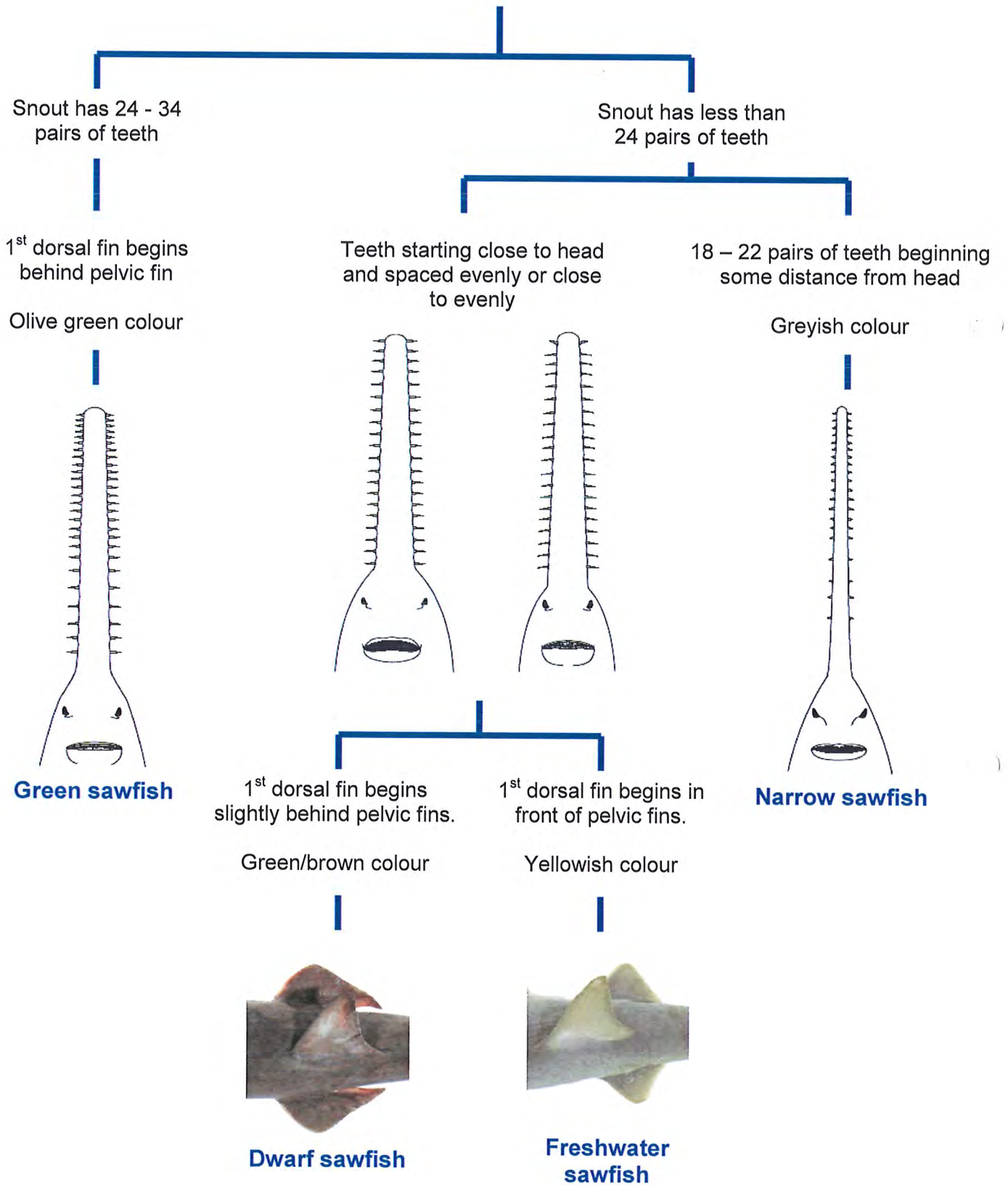
REPORTING INTERACTIONS

Professional fisherman can be an important source of information and observations on sawfish. Direct interactions allow sizes and other information on sawfish to be monitored over time. All interactions should be accurately recorded on log returns.

Records should include the date of interaction, species, size of the sawfish (approximate length), location and whether the sawfish was released alive or dead.

IDENTIFICATION

The identification key below will help identify sawfish species found within the Northern Territory. Follow the flow chart and match the number of teeth, their spacing and the positioning of dorsal fins to the sawfish in question.



RISK ANALYSIS

The following rankings have been used in the risk analysis.

LIKELIHOOD RANKING

Rare	May occur in exceptional circumstances
Possible	Evidence to suggest this may occur
Likely	It is expected to occur

CONSEQUENCE RANKING

Minor	Possibly detectable but minimal impact on structure/function
Moderate	A level of impact where recovery can take months or even years
Major	Very serious impacts with a relatively long time frame likely to be needed to restore to an acceptable level - recovery measured in years to decades

RISK RANKING

Low	Insignificant risk to the environment due to a combination of minor consequence and unlikely to occur
Medium	Increased likelihood of occurring with undesirable consequences
High	Likely to occur with significant consequences

LEGISLATION

Non compliance with fisheries legislation

RISK CATEGORY: LOW

Occurrence Likelihood: Possible

Occurrence Consequence: Minor

Justification

Offshore Net and Line Licensee Committee members are familiar with and understand the legislative requirements imposed on them. The penalties for non compliance are high. The co-management structure which NT Fisheries and the Committee have established, should ensure that many discussions and communications are undertaken prior to potential changes to regulations. Licensees are also encouraged to report any non compliance to the relevant authorities.

Non compliance with conservation legislation

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Committee members are familiar with and aware of other legislative requirements through various conservation regulations which affect fishing activities. The Northern Territory Seafood Council has active participation in issues surrounding sacred sites, marine protected areas and land conservation and this information is passed on to all licensees.

RETAINED SPECIES

Loss of fish due to rapid deterioration of fishing conditions

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

It is rare that catch is lost due to rapid deterioration of fishing conditions. Measures such as checking weather conditions, maintaining fishing equipment and formal training undertaken by skipper's and crew ensure a high degree of professionalism and understanding of their working environment. All preparations are undertaken to ensure the vessel and gear is maintained in top condition to reduce any potential loss in both fishing time and catch.

Loss of fish due to exceptionally large catches

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Nets are checked and cleared on a regular basis to ensure high quality catch. The time that longlines are left in the water is kept to a minimum to obtain the highest quality product. Fishing operators are experienced in minimising the risk of ending up with unmanageable, large catches.

Unsustainable depletion of shark or Grey mackerel stocks as a result of commercial fishing

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Moderate

Justification

Accurate reporting via log returns provides Fisheries with the data required to determine the annual take of target species. The fishery was recently accredited as ecologically sustainable for export under the *Environment Protection Biodiversity and Conservation Act 1999*. This accreditation acknowledges that current management techniques used in the fishery are adequately protecting target stock. Annual catch data is analysed on an ongoing basis with trigger points set to review current management practices if necessary.

Unsustainable depletion of by-product species resulting from commercial fishing

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Accurate reporting of species caught through log returns and observer trips provide Fisheries with a sound understanding of the quantity of by-product species caught. The fishery was recently accredited as ecologically sustainable for export under the *Environment Protection Biodiversity and Conservation Act 1999*. This accreditation acknowledges that current management techniques used in the fishery are adequately protecting by-product stock. Trigger levels are set to investigate further management options if levels of by-product species change.

NON-RETAINED SPECIES

Death of fish by-catch before release from longline

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Longlines are left to soak for the minimum amount of time in order to obtain maximum quantity of catch. All by-catch is required by law to be returned to the water with the least possible injury or damage as quickly as possible.

Death of fish by-catch after release from longline

RISK CATEGORY: LOW

Occurrence Likelihood: Possible

Occurrence Consequence: Minor

Justification

If the by-catch is alive when the longline is retrieved, it's chances of survival are high. All by-catch is released as per the Code of Practice.

Death of fish by-catch before release from net

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

All efforts are made within the fishery to reduce the amount of by-catch as by-catch wastes time and resources in clearing the net of species which are not to be retained. Nets are set in a manner to keep by-catch to a minimum. Nets are cleared on a regular basis with a maximum soak time of 3 hours. Most catch, including by-catch are still alive when the net is hauled. All by-catch is required by law to be returned to the water with the least possible injury or damage as quickly as possible.

Death of fish by-catch after release from net

RISK CATEGORY: LOW

Occurrence Likelihood: Possible

Occurrence Consequence: Minor

Justification

By-catch is returned as per the Code of Practice. Survival of by-catch is dependent on the time caught in the net. The longer the time by-catch spends in the gill net, the chances of survival decrease. Nets are cleared regularly to ensure high quality catch and this also maximise by-catch survival. If by-catch is released alive from a net, the survival chance is high.

INTERACTIONS WITH WILDLIFE

Interactions with crocodiles

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

No crocodile to date has been caught using longline or net fishing gear in the Offshore Net and Line fishery. In the event of a crocodile being caught there are Northern Territory Seafood Council publications which can be used as a guide for successful release.

Interactions with dugongs

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Dugongs are commonly found feeding in Northern Territory waters where the right type of seagrass beds exist, primarily in estuaries and shallow coastal waters with sandy or muddy bottoms. Offshore Net and Line fishing does not occur in dugong rich areas.

Interactions with dolphins and whales

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

There are no reports to date of interactions between dolphins or whales and the Offshore Net and Line fishery.

Interactions with birds

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Professional operators frequently observe a variety of birds such as sea eagles, kites and pelicans during fishing operations. No birds approach the nets to feed on fish underwater as the target species are too large for the birds.

Interactions with turtles

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

On the rare occasion that a turtle is entangled in a professional net or longline, it is carefully removed from the fishing gear and released back into the water with no or minimal injury. While there are a number of endangered turtle species in Northern Territory, interactions are rare. Best practice guidelines are in place to deal with any interactions in the Seafood Council's publication *Interactions with Protected Species – Marine Turtles*.

The improper use of a bottom set net by a single fisher in late 1991 resulted in the death of approximately 100 turtles. As a result of this incident, the use of bottom set nets was prohibited in 1992 and there have been no further turtle kills.

Interactions with sawfish

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Sawfish can pose a threat to the safety of operators when they are caught in fishing gear. Sawfish are quite prevalent around certain areas of the Northern Territory but when interactions do occur the sawfish are able to be released unharmed in the vast majority of cases. Best practice guidelines are in place to deal with any interactions in the Seafood Council's publication *Interactions with Protected Species - Sawfish*.

IMPACTS ON THE BIOLOGICAL COMMUNITY

Lost or discarded fishing equipment

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

It is rare for Offshore Net and Line operators to lose fishing equipment. No gear has been found intentionally discarded at sea. Nets that are too damaged and any rubbish or wastes (excluding fish wastes) are disposed of on land as per the Code of Practice. All efforts are made to recover any lost fishing gear, as well as retrieving any other derelict gear found, as it presents possible hazards to marine life and fishing operations.

Spread of marine pests within Territorial waters

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Moderate

Justification

There are currently no known marine pests of concern within the areas in which the Offshore Net and Line fishery operates. Offshore Net and Line operators do not transfer any biological material between sites other than their catch, which is processed as quickly as possible after capture.

WATER QUALITY

Chemical spill

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

The Code of Practice covers safe and appropriate storage of chemicals, including fuel on board the vessel. Other than bio-degradable cleaning detergents, few if any chemicals are carried onboard vessels. During fishing operations clean sea water is used to rinse equipment and a more thorough clean is carried out upon the completion of the fishing trip.

Pollution from outboard motors or fuel spill

RISK CATEGORY: LOW

Occurrence Likelihood: Possible

Occurrence Consequence: Minor

Justification

The small fleet of well maintained vessels ensures that pollution from fuel use is minimal. Fuel tanks and connector hoses are maintained in good working order as the majority of fishing operations are conducted in remote areas. While Offshore Net and Line vessels sometimes refuel at sea, in the event of a spill occurring, the quantity of fuel would be small.

AIR QUALITY

Greenhouse gas emissions

RISK CATEGORY: LOW

Occurrence Likelihood: Likely

Occurrence Consequence: Minor

Justification

Due to the small size of the commercial Offshore Net and Line fishing fleet and the low fuel consumption, the amount of greenhouse gas emissions is low. In addition, all motors are maintained at a high standard as the majority of fishing operations are conducted in remote areas.

SUBSTRATE QUALITY

Damage to seagrass

RISK CATEGORY: LOW

Occurrence Likelihood: Rare

Occurrence Consequence: Minor

Justification

Offshore Net and Line operators know the value of seagrass for fish stocks and have the skills and local knowledge necessary to avoid physical impact on seagrass beds. Operations are not conducted in seagrass areas and the fishing method employed does not come into contact with seagrass.

EXTERNAL RISKS TO THE FISHERY

Illegal fishing

RISK CATEGORY: MEDIUM

Occurrence Likelihood: Likely

Occurrence Consequence: Moderate

Justification

Illegal fishing and marketing of shark fin is of high concern to the Offshore Net and Line Licensee Committee. Illegal fishing in Northern Territory waters is known to occur but the quantities of fish illegally taken are unknown. The major risk of illegal fishing by non licensed people is exceeding of legal bag limit. Illegal foreign fishing also poses a threat to the sustainable use of stocks and the Committee and the Northern Territory Seafood Council are working at the Territory and federal Government levels to try to minimise this type of illegal fishing.

REGISTER OF RELEVANT LEGISLATIVE REQUIREMENTS

Legislation	Summary of Purpose	Relevance	Agency
<i>Aboriginal Land Act</i> (Northern Territory)	An Act to provide access to Aboriginal land, certain roads bordered by Aboriginal land and the provision to apply for closure of seas adjacent to Aboriginal land.	Entry onto Aboriginal land and seas adjoining.	Department of Planning and Infrastructure
<i>Animal Welfare Act</i> (Northern Territory)	An Act to provide for the welfare of animals, prevent cruelty to animals and for related purposes.	Animal welfare obligations and offences.	Local Government, Housing and Sport
<i>Cobourg Peninsula Aboriginal Land, Sanctuary and Marine Park Act</i> (Northern Territory)	An Act to acknowledge and secure the right of Aboriginals to occupy and use certain land on the Cobourg Peninsula.	Management of adjacent marine areas of Cobourg Peninsula.	Department of Natural Resources, Environment and the Arts
<i>Darwin Port Corporation Act</i> (Northern Territory)	An Act to provide for the establishment of the Darwin Port Corporation for the control and management of the Port of Darwin, and for related purposes.	Prevention of pollution from oil within the port and management of fishing industry related facilities in the Port.	Darwin Port Corporation
<i>Doctors Gully Aquatic Life Reserve Management Plan</i> (Northern Territory)	Specific Regulations under the <i>Fisheries Act</i> for the area in question.	Restrictions on taking fish or aquatic life within the reserve.	Department of Primary Industry, Fisheries and Mines
<i>East Point Aquatic Life Reserve Management Plan</i> (Northern Territory)	Specific Regulations under the <i>Fisheries Act</i> for the area in question.	Restrictions on taking fish or aquatic life within the reserve.	Department of Primary Industry, Fisheries and Mines
<i>Environment Protection Biodiversity Conservation Act 1999</i> (Commonwealth)	An Act relating to the protection of the environment and the conservation of biodiversity, and for related purposes.	Protection of threatened species, marine debris, export and import controls.	Department of the Environment and Heritage

Legislation	Summary of Purpose	Relevance	Agency
<i>Fisheries Act</i> (Northern Territory)	An Act to provide for the regulation, conservation and management of fisheries and fishery resources so as to maintain their sustainable utilisation, to regulate the sale and processing of fish and aquatic life, and for related purposes.	Administration of licences, registration of fishing vessels, recording requirements.	Department of Primary Industry, Fisheries and Mines
<i>Fisheries Regulations</i> (Northern Territory)	Regulations under the <i>Fisheries Act</i> .	Protected species, possession of gear, fish safety and quality, processing and sale of fish, gear requirements, aquatic pests.	Department of Primary Industry, Fisheries and Mines
<i>Heritage Conservation Act</i> (Northern Territory)	An Act relating to the natural and cultural heritage of the Northern Territory.	Declaration and protection of heritage places and objects.	Department of Natural Resources, Environment and the Arts
<i>Historic Shipwreck Act 1976</i> (Commonwealth)	An Act to protect historically significant shipwrecks.	Protection of historically significant shipwrecks.	Department of the Environment and Heritage
<i>Marine Act</i> (Northern Territory)	An Act to regulate shipping within the Territory and to provide for the application to the Territory of the Uniform Shipping Laws Code and for related matters.	Safety of ship, closure of waters, collisions, casualties.	Department of Planning and Infrastructure
<i>Marine Pollution Act</i> (Northern Territory)	An Act to protect the marine and coastal environment by minimising intentional and negligent discharges of ship-sourced pollutants into coastal waters, and for related purposes.	Control and prohibition of discharges of oil, noxious substances, garbage and pollutants in coastal waters to 3 nm.	Department of Planning and Infrastructure
<i>Marine Pollution Regulations</i> (Northern Territory)	Regulations under the <i>Marine Pollution Act</i> .	Disposal of food wastes, garbage and reporting incidents.	Department of Planning and Infrastructure

Legislation	Summary of Purpose	Relevance	Agency
<i>Northern Territory Aboriginal Sacred Sites Act</i> (Northern Territory)	An Act to effect a practical balance between the recognised need to preserve and enhance Aboriginal cultural tradition in relation to certain land in the Territory.	Access, entry and permission to enter sacred sites. Offences in relation to sacred sites.	Minister assisting the Chief Minister on Indigenous Affairs
<i>Protection from the Sea (Prevention of pollution from ships) 1983</i> (Commonwealth)	An Act relating to the protection of the sea from pollution by oil and other harmful substances discharged from ships.	Discharge of oil, noxious substances, sewage, garbage and pollutants in Commonwealth waters.	Australian Government
<i>Territory Parks and Wildlife Conservation Act</i> (Northern Territory)	Establishment of Parks and Reserves and the study, protection, conservation and sustainable utilisation of wildlife.	Protection of wildlife and conservation of natural resources.	Department of Natural Resources, Environment and the Arts
<i>Territory Wildlife Regulations</i> (Northern Territory)	Regulations under the <i>Territory Parks and Wildlife Conservation Act</i> .	Specific measures for protection and conservation.	Department of Natural Resources, Environment and the Arts
<i>Waste Management and Pollution Control Act</i> (Northern Territory)	An Act to provide for the protection of the environment through encouragement of effective waste management and pollution prevention and control practices and for related purposes.	General environmental duty, notification of pollution incidents.	Department of Natural Resources, Environment and the Arts
<i>Water Act</i> (Northern Territory)	An Act to provide for the allocation, use, control, protection, management and administration of water resources, and for related purposes.	Prohibits the pollution of water.	Department of Natural Resources, Environment and the Arts
<i>Work Health Act</i> (Northern Territory)	An Act to promote occupational health and safety, prevent workplace injuries and diseases, protect the health and safety of the public in relation to work activities.	Take reasonable care of health and safety at work.	Department of Employment, Education and Training