



PROTEGE

ATERPECHE

Atelier technique régional de capitalisation PROTEGE sur les pêches côtières  
20 au 24 novembre 2023 – Nouméa, Nouvelle-Calédonie



Financé par  
l'Union européenne



Pacific  
Community  
Communauté  
du Pacifique



WALLIS ET FUTUNA



REPUBLIQUE  
FRANCAISE  
NOUVELLE  
CALÉDONIE



POLYNÉSIE FRANÇAISE



ÎLES PITCAIRN



PROTEGE

# Gestion des pêches

Will Bowman, Program Director Wild Harvest Fisheries, Northern Territory Government (Australie)



Financé par  
l'Union européenne



Pacific  
Community  
Communauté  
du Pacifique



WALLIS ET FUTUNA



NOUVELLE  
CALÉDONIE



POLYNÉSIE FRANÇAISE



ÎLES PITCAIRN



## Plan

### 1. Overview of Fisheries and Aquaculture in the Northern Territory

- Context
- Fisheries overview
- Northern Territory – Fisheries Division
- Wild Harvest fisheries
- Harvest Strategies

### 2. Mud crab

- Fishery – Overview, Rules
- Harvest Strategy – Performance indicators, Management actions, Data collection

### 3. Spanish Mackerel

- Fishery – Overview
- Harvest strategy – Performance indicators, Management actions

### 4. Coastal line fishery

- Fishery – Overview, Key species, Reef Fish resource use and risks, Management, Commercial rules, Recreational rules
- Harvest Strategy – Performance indicators, Management actions

### 5. Recreational fishing

- Customary Fishing and economic development
- Incorporation into Management Frameworks



# 1. Overview of Fisheries and Aquaculture in the Northern Territory – context

- Northern Territory
  - Area (land 1,347,791 km<sup>2</sup>)
  - Water 71,839 km<sup>2</sup>
  - Population 249,345
    - 30.8 % Aboriginal
    - <0.1% of Australia
- 11 000 kilometres of coastline supporting a diverse opportunities
- Commercial volumes fisheries and aquaculture ~10,000 tonnes, (currently valued at AU\$120 million per year)
- Focus on high quality product





## Fisheries overview

- Best practice contemporary management
  - *Northern Territory Fisheries Act 1988*
- The role of the Fisheries Division is to ensure that these aquatic resources are managed in accordance with the principles of ecologically sustainable development (ESD)
  - *To share access to aquatic resources between commercial industry, Aboriginal people and recreational fishers*
  - *Promote the optimum use of aquatic resources to the benefit of the community*
- Aboriginal community development projects (artisanal fisheries)
- Recreational fishing and fishing tourism are major industries and drivers of management







## Northern Territory – Fisheries Division

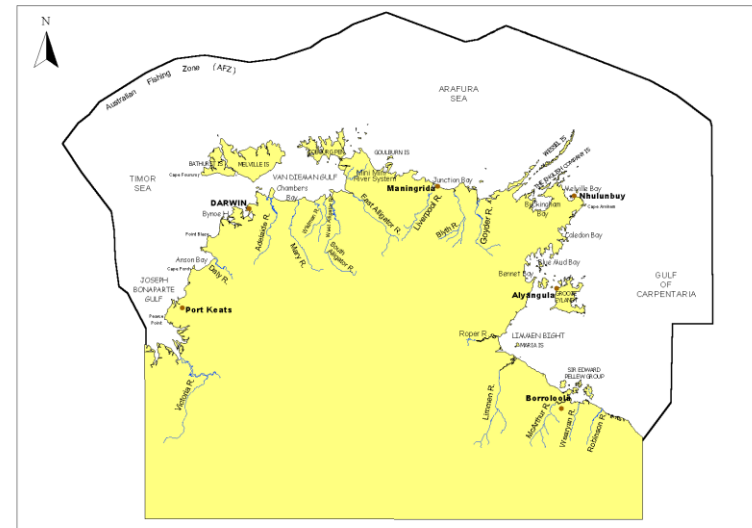
Section	Staffing
Executive Management	3
Fisheries Management	10
Fisheries Research	12
Fisheries Compliance	9
Fisheries Licensing and corporate services	14
Aquaculture	13
Aquatic biosecurity	2
Aboriginal development and Marine Ranger program	5
Communications and engagement	2





## Wild Harvest fisheries

- There are 14 wild harvest fisheries operating in waters of the NT
- Offshore fisheries primarily commercial production
- Inshore fisheries mix of commercial, recreational, tourism fishing, and Aboriginal traditional harvest
- Risk based approach to best practice management
  - Contemporary management arrangements
  - Ecological risk assessments
  - Compliance risk assessments
  - **Harvest strategies**





## Harvest Strategies

Harvest Strategy design must be based on using the best available data.

Harvest strategies use indicators to monitor the 'performance' of a fishery

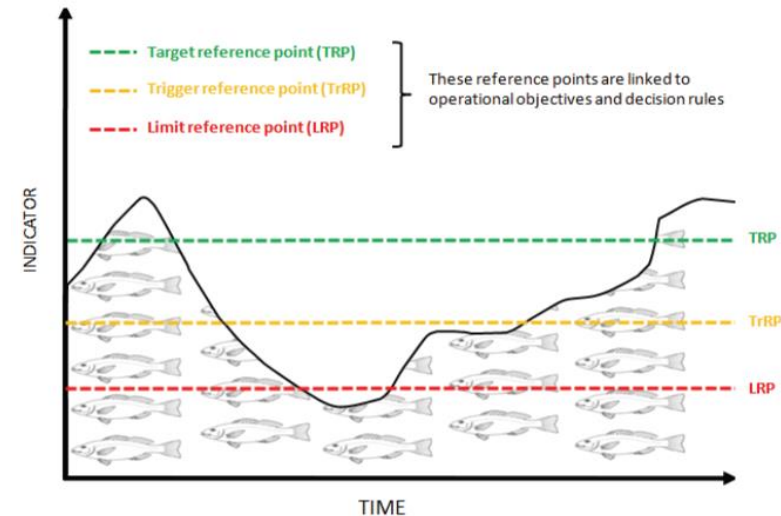
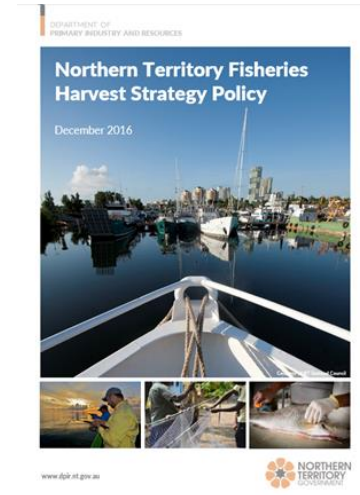
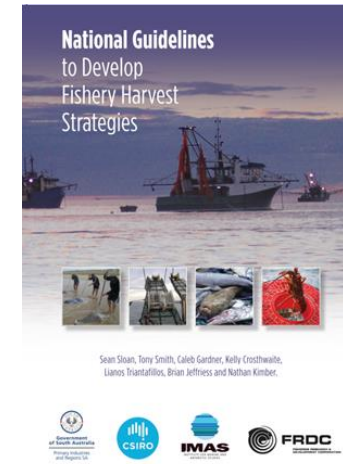
The indicators have reference points that include:

Target - where the fishery wants to be.

Trigger - early warning.

Limit - initiates significant management

Harvest strategies must be reviewed periodically to ensure they remain 'fit for purpose', and updated/improved as better data becomes available.

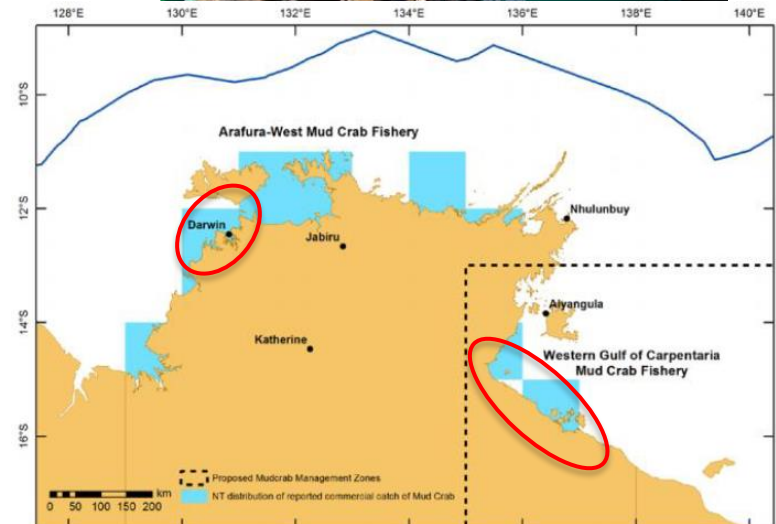






## 2. Mud Crab Fishery - overview

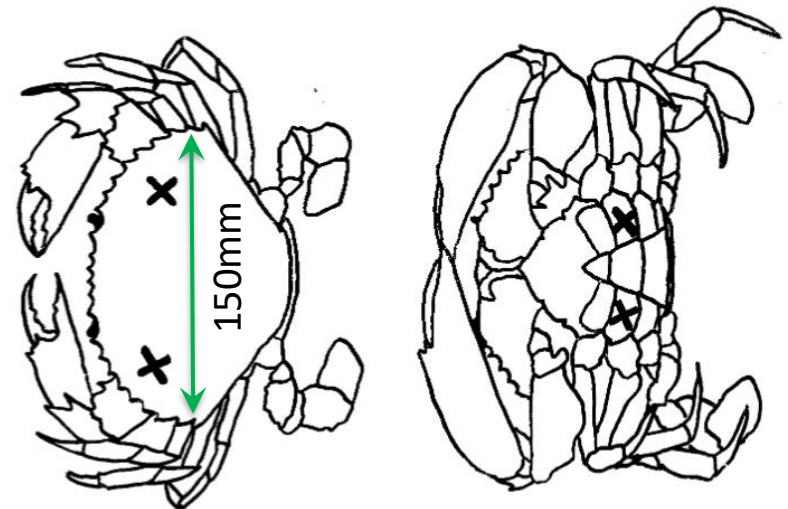
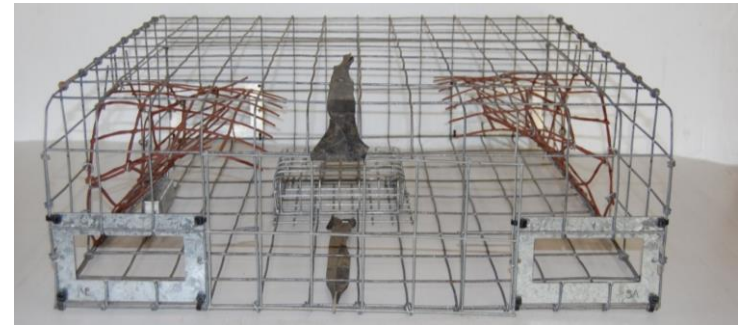
- Targets *Scylla serrata*, some *S. olivacea* caught.
- The extent of the NT Mud Crab Fishery is to the AFZ, however operations occur in tidal waters of the NT.
- Significant commercial sector – AUD\$8.5M
- Popular recreational and customary harvest species.
- There is a maximum of 49 commercial licences in the fishery.
- Licences use crab pots that are set within estuaries or along the coastal fringe and are checked and re-baited daily.
  - Arafura-West average harvest is 124t.
  - Western GoC average harvest is 215t.





## Mud Crab Fishery – rules

- Regulated Pots (number, size/dimensions, ropes, labelling, escape vents)
- Crabs restrained, commercially suitable.
- Vessel Monitoring System (VMS) all commercial vessels
- Spatial closures (commercial)
- Logbooks
- Size limits
  - Commercial – male 140mm, female 150mm carapace width.
  - Recreational, tourism – male 130mm, female 140mm carapace width.
- Possession limits (recreational, tourism)



Female

Male



## Mud Crab Harvest Strategy – Performance indicators

- Reporting zones (Arafura/WGOC)
- Two performance indicators

### *Primary performance indicator*

- Catch per unit effort (CPUE), based on Kg/pot day

	Limit	Lower trigger	Target	Upper trigger
West-GoC	0.2	0.3	0.6	0.7
Arafura-West	0.2	0.3	0.6	0.7

### *Secondary performance indicator*

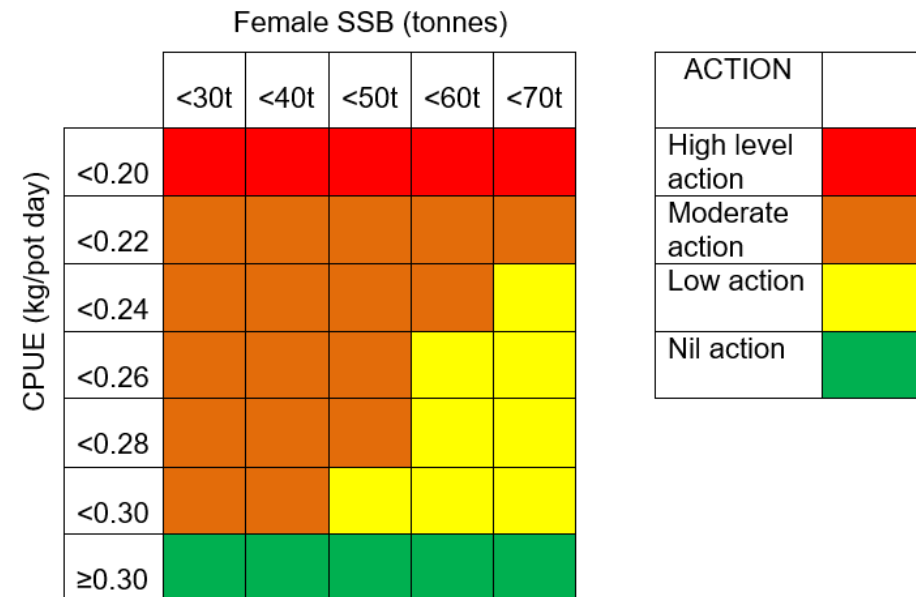
- Female spawning biomass model (FSSB)

	Target (FSSB)
West-GoC	70 tonnes
Arafura-West	70 tonnes



## Mud Crab Harvest Strategy – Management actions

- Target (CPUE above 0.3 kg/pot day)
  - no change to operating practices
- Lower trigger point (CPUE between 0.2 – 0.3 kg/pot day)
  - Review secondary performance indicator (FSSB):
    - *Low action – 3 week closure*
    - *Moderate action – 6 week closure*
- Limit reference point (CPUE below 0.2 kg/pot day)
  - *High action – 3 month closure*



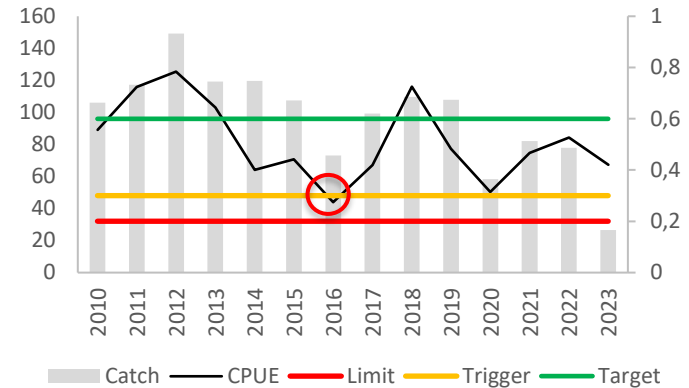




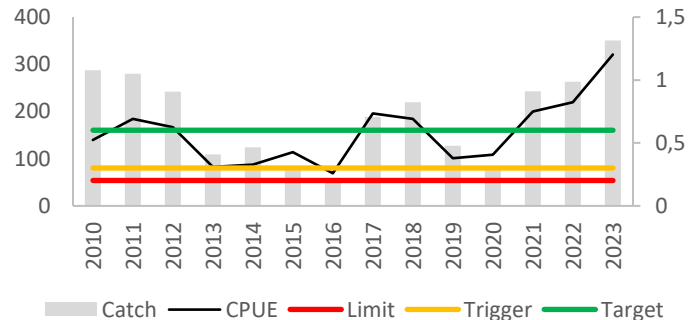
## Mud Crab Harvest Strategy – Data collection

- Data collection primary performance indicator occurs April-May annually.
- Data collection for the secondary performance indicator based on previous 12 months.

Arafura zone



Gulf of Carpentaria zone



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lower trigger				←---→	←---→					→---←	→---←	→---←
Limit reference				←---→	←---→					→---←	→---←	→---←
Upper trigger	←---→	←---→	←---→	←---→	←---→	←---→	←---→	←---→	←---→	←---→	←---→	←---→





### 3. Spanish Mackerel Fishery - overview

- The NT Spanish Mackerel Fishery extends from the high water mark to the outer limit of the Australian Fishing Zone (AFZ)
- Significant commercial sector (AUD\$5.6M)
- Popular recreational and tourism species.
- There are 15 commercial licences in the fishery with a Total Allowable Catch (TAC), however the fishery is currently transitioning to an Individual Transferable Quota (ITQ) management system.
- Licensees typically fish from a mother ship and dories, with a maximum of two dories permitted per licence.
- Commercial licences may use any number or combination of troll lines, floating hand lines or rods.
  - Licences generally troll two to four lines behind a dory and up to eight lines from a mother boat
- Recreational, tourism possession limits

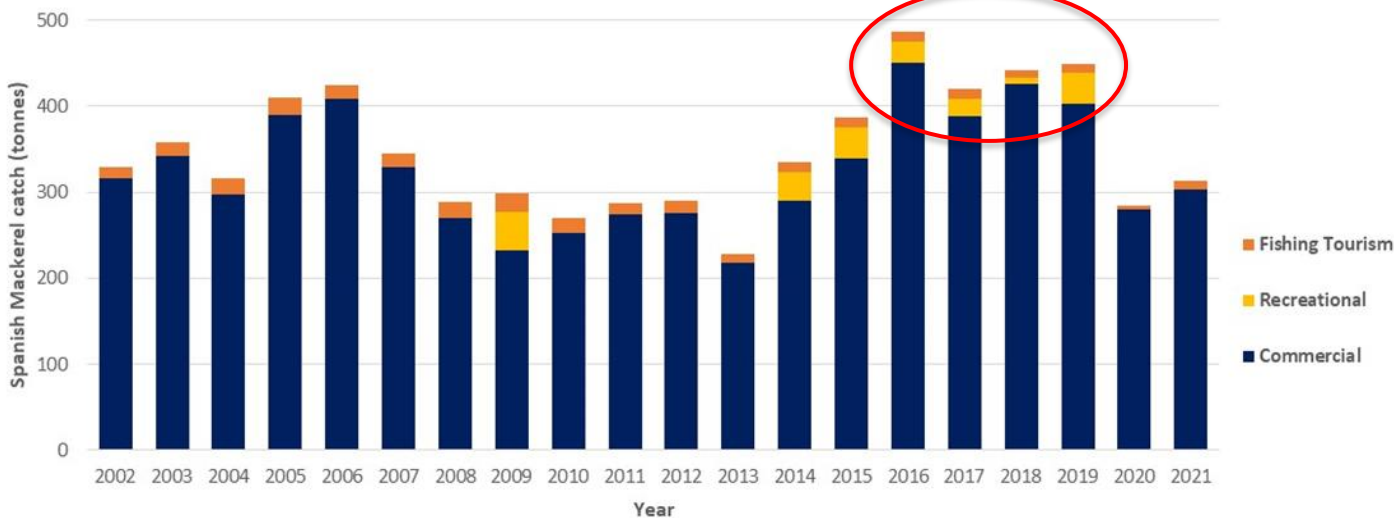


# PÊCHE CÔTIÈRE ET AQUACULTURE



- Formal catch share arrangement in place.
- Commercial operators over-caught their share, triggering a review of the fishery and introduce Harvest Strategy.
- VMS mandatory by 1 July 2024.

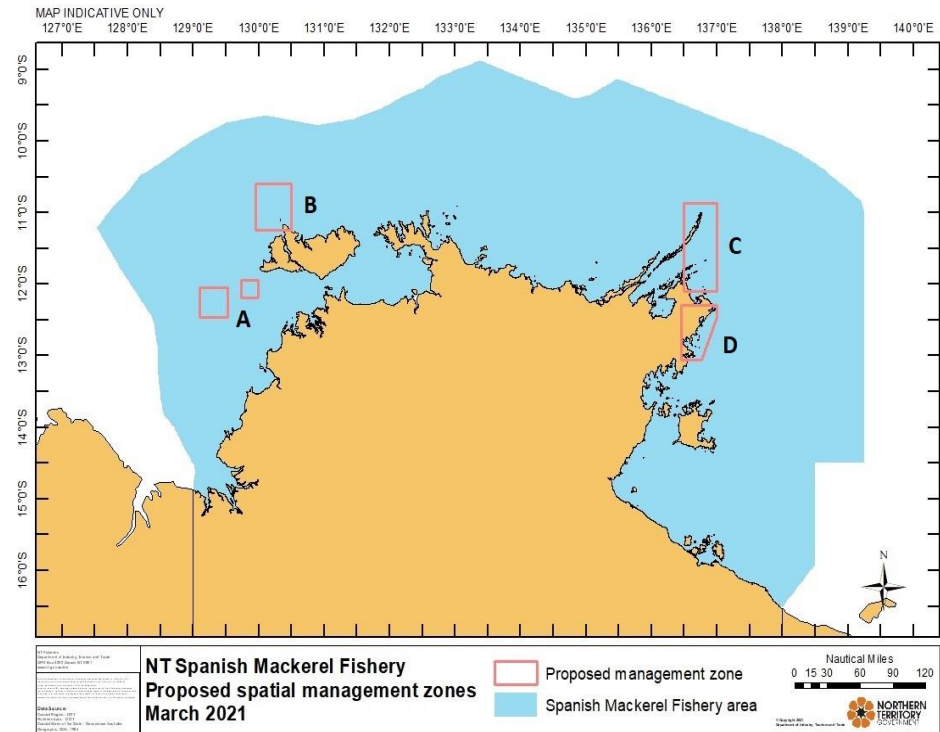
User group	Catch share (%)
Spanish Mackerel Fishery licences	76
Recreational fishers	16
Offshore Net and Line Fishery licences	3
Fishing Tour Operator licences	3
Demersal Fishery licences	1
Aboriginal Traditional fishers	1
<b>TOTAL</b>	<b>100</b>





## Spanish Mackerel Harvest strategy – Performance indicators

- Biomass performance indicator
  - Relative biomass (fishery-wide) Stock Reduction Analysis (SRA) based on commercial catch and effort data.
  - *Every 2 years*
- Catch rate performance indicator
  - CPUE (Kg/line hour)
  - Applied in four 'zones' that account for ~80% commercial catch.
  - *Every 3 months (Quarterly)*







## Spanish Mackerel Harvest Strategy – Management actions

- Biomass performance indicator reference points
  - Target –  $B_{60}$
  - Trigger –  $B_{50}$
  - Limit –  $B_{30}$
- Catch rate performance indicator reference points
  - Reference points specific to each management zone
  - If below Trigger for consecutive quarters – 3 month closure in relevant zone
  - If below Trigger for the quarter post re-opening – 3 month closure
  
  - If below Limit – 3 month closure
  - If below Limit for the quarter post re-opening – 6 month closure



# PÊCHE CÔTIÈRE ET AQUACULTURE



Indicator value	
Target	
Trigger	
Limit	
No fishing	

Zone status	
Open	
Closed	

	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Indicator value								
Zone status								

	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Indicator value								
Zone status								

	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Indicator value								
Zone status								

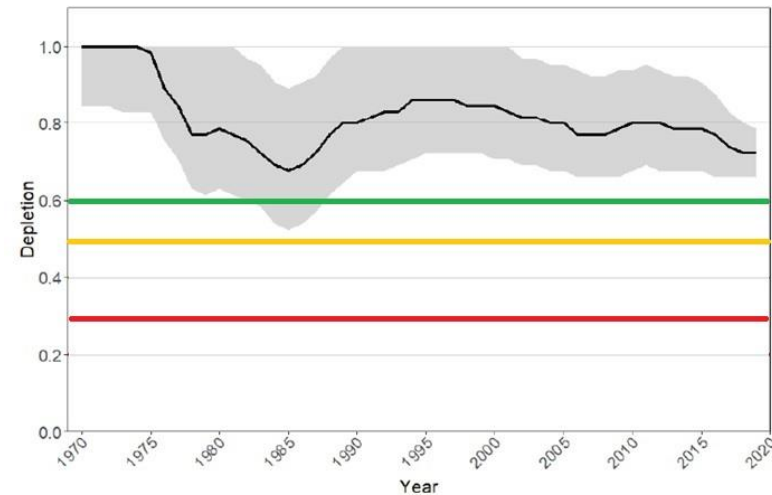
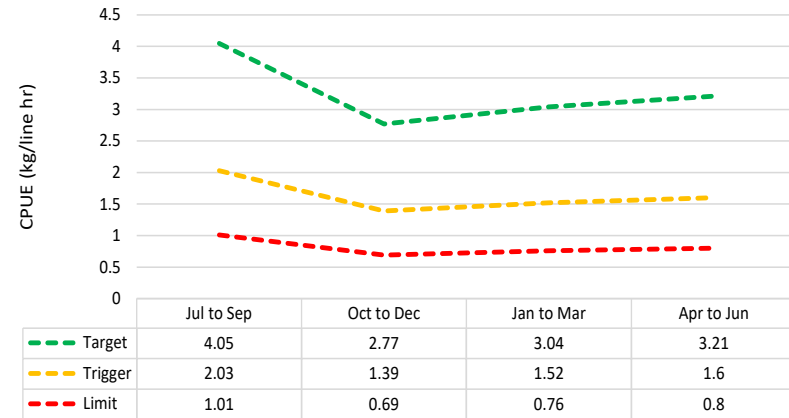
	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Indicator value								
Zone status								

	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Indicator value								
Zone status								

	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Indicator value								
Zone status								

	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Indicator value								
Zone status								

Reference Points for Flat Top Shepparton Management Zone



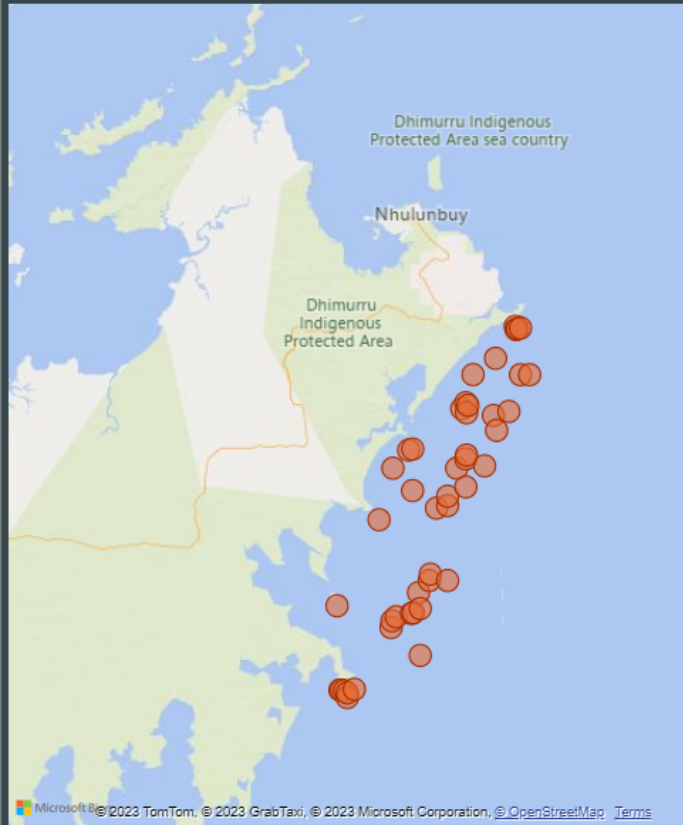


# PÊCHE CÔTIÈRE ET AQUACULTURE

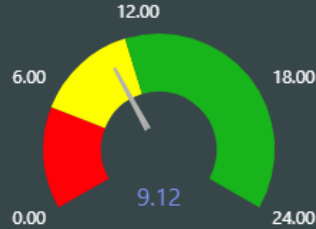


## Quarterly CPUE Reference Points for the Cape Arnhem Zone

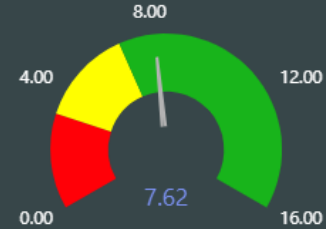
Zone ● Arnhem



Mean CPUE Q1; Target = 20.60



Mean CPUE Q2; Target = 12.82



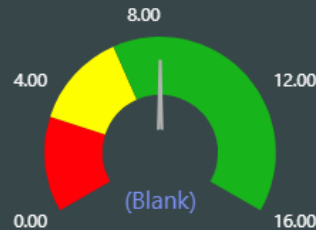
Year

2021/2022

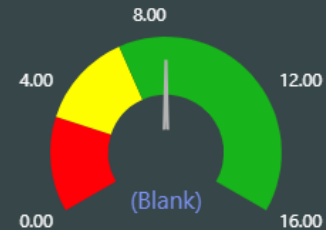
Licence

All

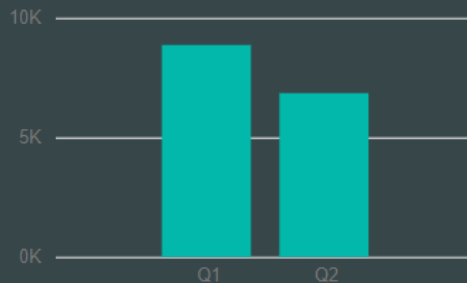
Mean CPUE Q3; No target set



Mean CPUE Q4; No target set



Catch (Kg) by Quarter



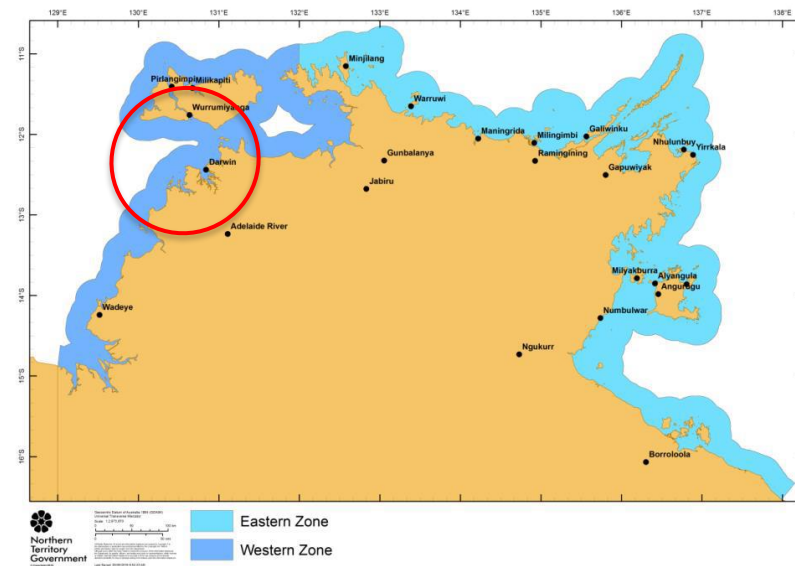
Effort (line hours) by Quarter





## 4. Coastal Line Fishery - overview

- The Coastal Line Fishery operates from high water mark to 15nm from the low water mark.
- Includes the take of all coastal reef fish species.
- Multi-sector fishery, important commercial, recreational, tourism, and customary harvest
- Significant effort in Darwin area.
- Commercial target species has shifted to be predominately Black Jewfish (AUD\$2.8M).
- Commercial fishery managed in 2 zones
  - Easter zone and Western Zone.
- Recreational and tourism sectors target all reef fish species.







## Coastal Line Fishery – key species

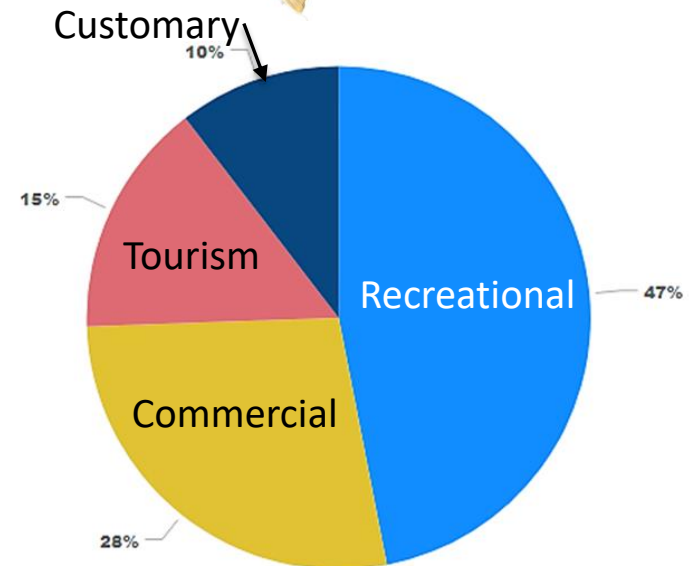
- Black Jewfish
- Golden Snapper
- Cods/grouper
- Stripey snapper
- Mangrove Jack
- Red Snapper
- Moses Snapper
- Tusk fish
- Red emperor
- Other emperors





## Reef Fish resource use and risks

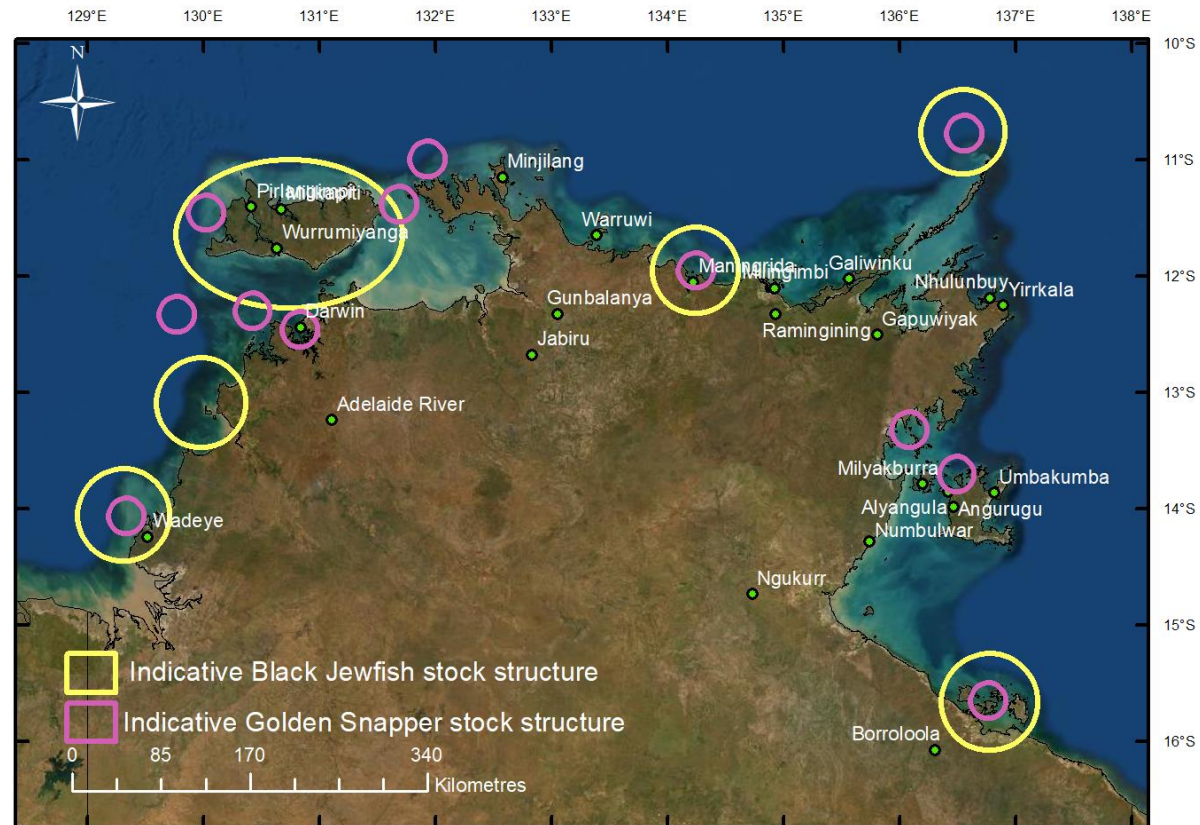
- Recreational sector 47% of catch, commercial sector 28%.
- **Golden Snapper** sustainability (recreational sector).
  - Classified as ‘depleted’ in the Darwin area.
- **Black Jewfish** value (commercial sector).
- Value of Black Jewfish swim bladder (maw) driving demand and compliance risk.
  - Up to AUD\$1000/kg ww
  - Each bladder typically 200-400g
- Both species vulnerable, with localised populations and aggregating behaviour, that has driven management responses.





## Reef Fish resource use and risks

- Stock structuring
- Barotrauma
- In the Darwin area:
- Good access to reef fishing.
- ~80% of tourism and recreational fishing effort.
- High risk of illegal trade





## Coastal Line Fishery Management

- Reef Fish Protection Areas
- Black Jewfish swim bladder tags
- Recreational and tourism rules

### POSSESSION LIMITS Swim bladders

#### Why is there a swim bladder possession limit?

A personal possession limit for swim bladders is important to protect our vulnerable reef fish such as Black Jewfish from illegal fishing. The new possession limit will prohibit persons from stockpiling swim bladders and potential illegal trade. The possession limits should not unduly affect the way you usually process your catch.



#### When does it apply?

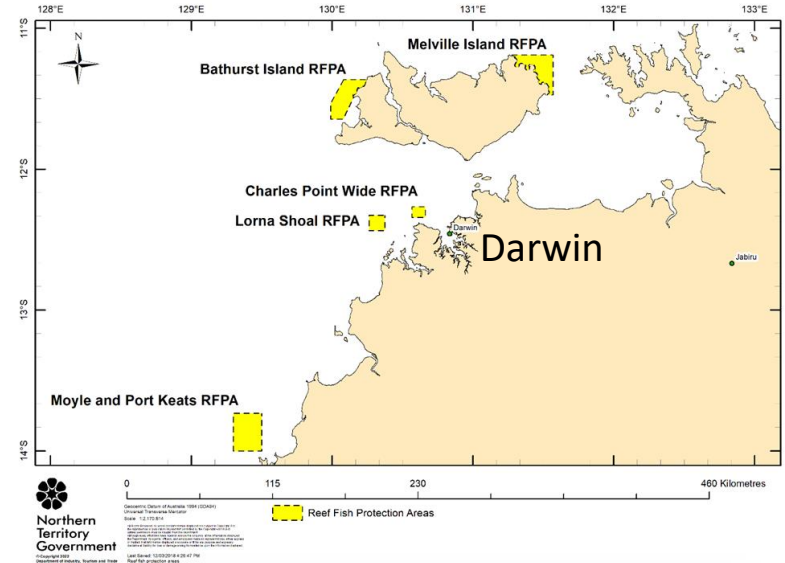
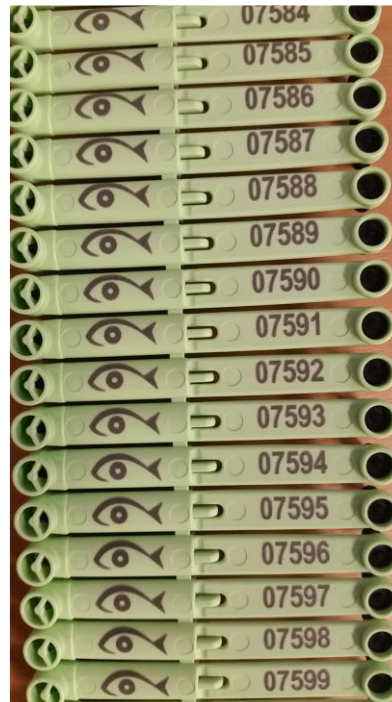
The personal possession limit for swim bladders came into effect on the 4th of July 2018 for all recreational fishers.

#### What are the changes?

- If you intend to retain a swim bladder for personal consumption you must keep the swim bladder inside the fish until you get home to your permanent residence.
- If you process fish away from your permanent residence you must immediately discard any swim bladders.
- A personal possession limit of 2 detached swim bladders (any species) applies at a person's permanent residence.
- A person must not be in possession of a detached swim bladder anywhere outside of their permanent residence.

#### Definition of permanent residence

A permanent residence does not include temporary occupancy, caravanning or camping but rather a fixed address which can be substantiated by photographic identification or similar.

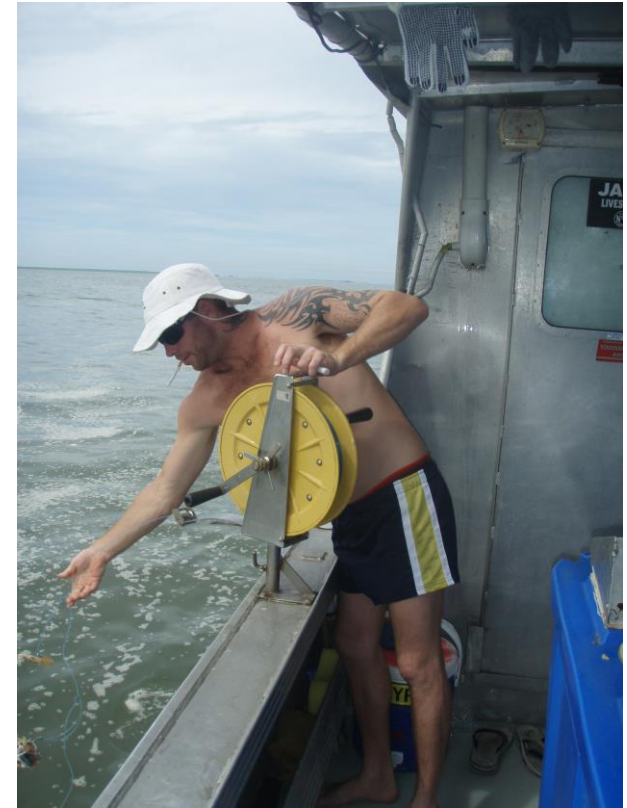






## Coastal Line Fishery – commercial rules

- There are a maximum of 51 commercial licences in the fishery
- Permitted gear types – handlines, hand reels and rods.
- The Western Zone has limited access and is managed using ITQ (145 tonnes).
- Daily logbooks, pre-departure notices, prior landing notices.
- All licences are able to fish in the Eastern Zone of the fishery.
- Vessel Monitoring System.





## Coastal Line Fishery – recreational rules

<b>General personal possession limit</b>	15 fish per person
<b>Personal possession limits</b>	2 Black Jewfish 3 Golden Snapper 3 Mangrove Jack 5 all other fish species
<b>Vessel possession limits</b>	Vessels with 4 or less people on board, each person can take their personal possession limit  Vessels with 5 to 7 people on board can take a maximum of 4 times the personal possession limit of 'at-risk' species  Vessels with 8 or more people on board can take a maximum of 8 times the personal possession limit of designated 'at risk' species
<b>Size limits</b>	Mangrove Jack, 35 cm minimum length Cod and groper, 120 cm maximum length



## Coastal Line Harvest Strategy – performance indicators

- Primary performance indicators for Golden Snapper and Black Jewfish
  - Relative biomass (fishery-wide) Stock Reduction Analysis (SRA) based on commercial and fishing tour operator catch and effort data.
  - *Annually*
- Catch rate performance indicator for Black Jewfish
  - CPUE (Kg/line hour)
  - Applied in three 'zones' that account for 100% commercial catch.
  - *Every 3 months (Quarterly)*
- Secondary species performance indicator
  - Analysis of total mortality for all secondary species.
  - MSY estimate - *Annually*



## Coastal Line Harvest Strategy – management actions

- Primary performance indicator reference points
- Catch rate performance indicator, reference points specific to each management zone
  - If biomass of Black Jewfish below 40%*
    - Trigger - implement a closure of the management area for 3 months in relevant zone
    - Limit - implement a closure of the management area for 6 months in relevant zone
- Secondary species performance indicator
  - Trigger – conduct research projects
  - Limit – reduce catch all sectors

### Golden Snapper

Target –  $B_{50}$

Trigger –  $B_{40}$

Limit –  $B_{30}$

### Black Jewfish

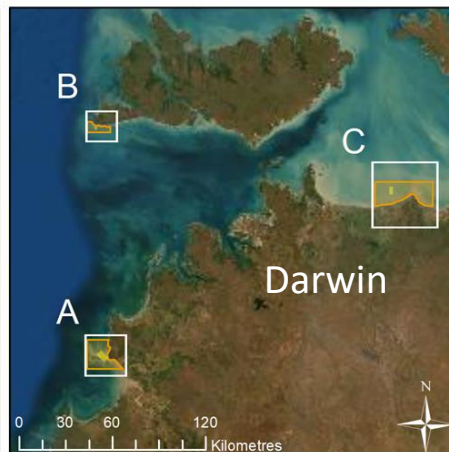
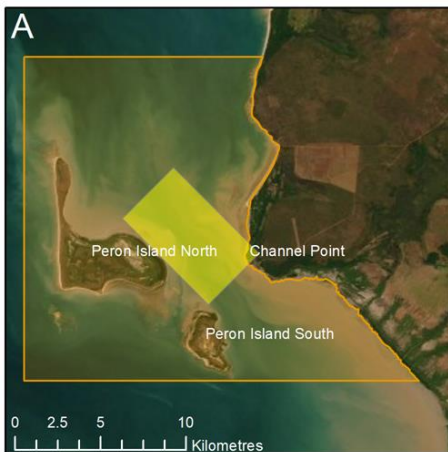
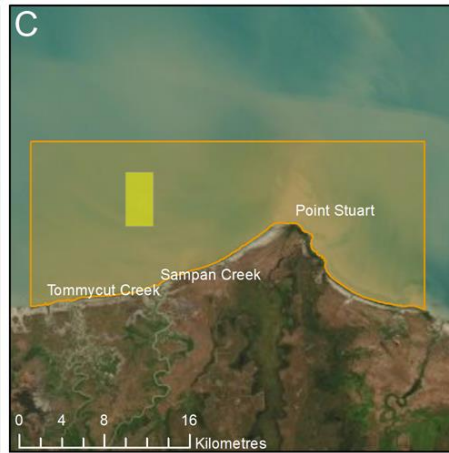
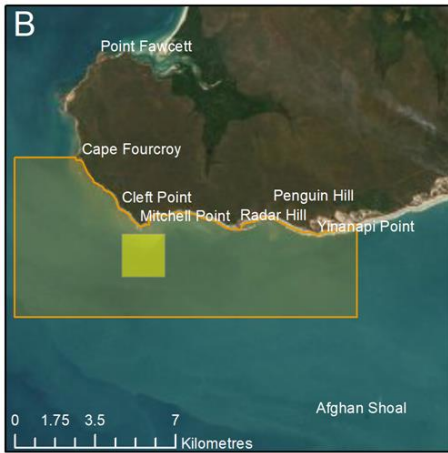
Target –  $B_{60}$

Trigger –  $B_{50}$

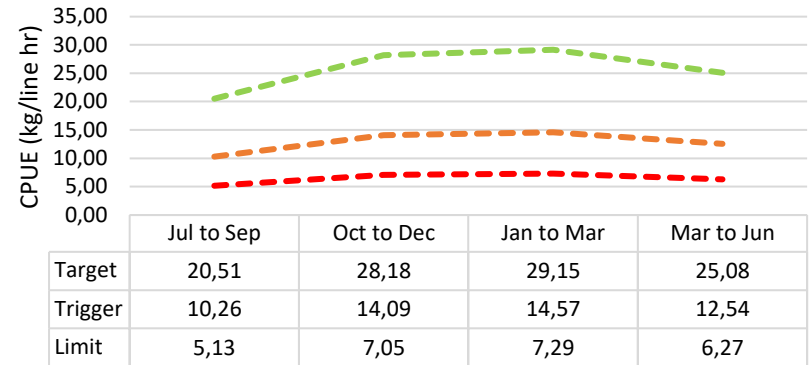
Limit –  $B_{30}$



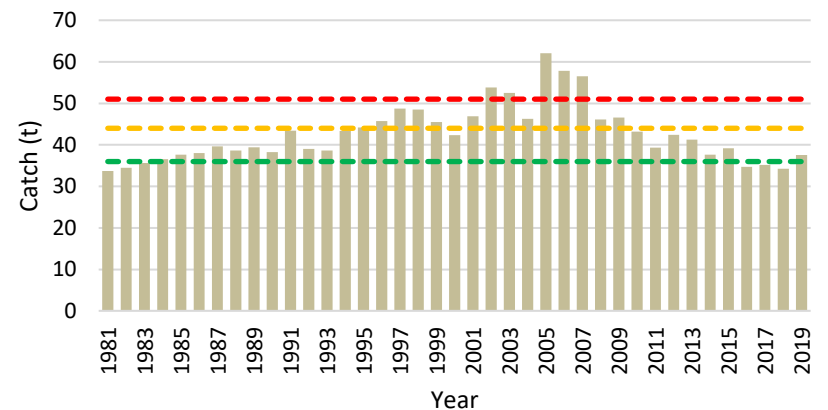
## Coastal Line Harvest Strategy



### Reference Points for Mitchell Point Management Area



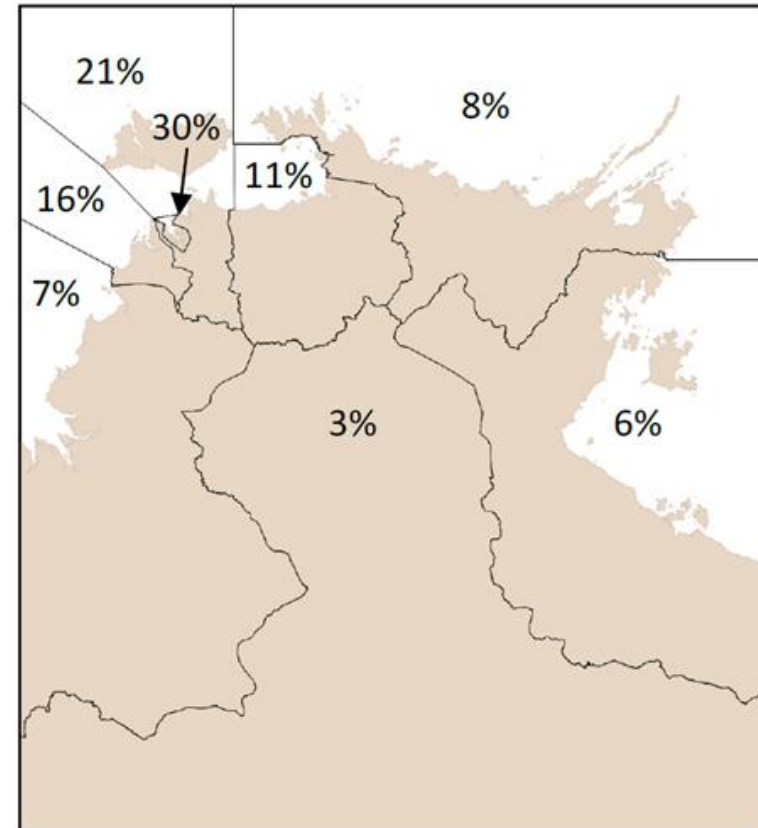
### Reference points for Grass Emperor





## 5. Recreational Fishing

- Recreational fishing is an intrinsic part of the NT lifestyle, with quality fishing experiences attracting many visitors and supporting a major guided fishing industry.
- Territory-wide recreational fishing surveys undertaken every 10 years.
- Darwin area recreational fishing surveys undertaken every 2 years.



 **60,800**  
Territorians went fishing

 Territorians spend an estimated **500,000 days** fishing each year

**33% of women** in the NT recreationally fish per year; the highest percentage of women who fish of any Australian jurisdiction.

 Recreational fishing in the Territory directly generated **\$144 million** and **\$126 million** by further indirect activity



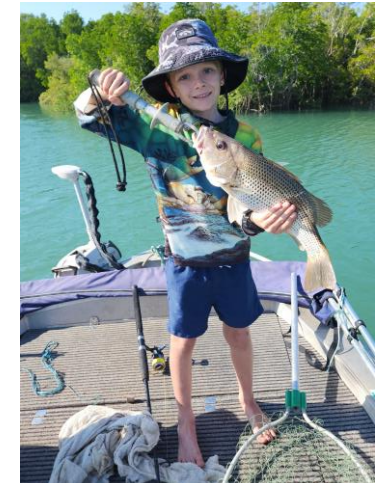


## Recreational Fishing

- Key focus of management:
  - Education – Presentations, school visits, show stalls, social media.
  - Messages – barotrauma, responsible fishing.
  - Long-term strategic planning
  - *Recreational Fishing Development Plan*



Northern Territory 2019 recreational fishing survey

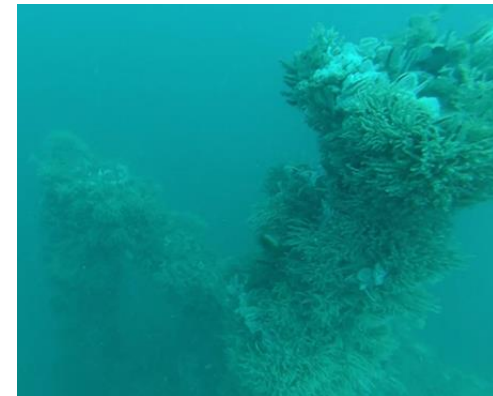
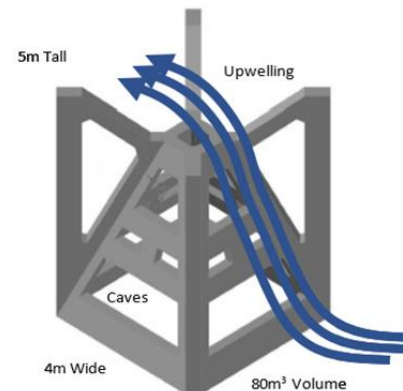




## Recreational Fishing

### Artificial Reef project

- Deployed in 2019
- Four reefs
- 29 modules in each reef (118 in total)
- 7 clusters per reef
- Approximately area of 2.5 Ha each
- Volume approximately 2300m<sup>3</sup>
- Estimated design life of 100 yrs
  
- New recreational fishing areas
- Maximise diversity
- Maximise new production
- Scale and scale-ability and long-term network development





## Customary Fishing and economic development

- Traditional use of fish resources
- 85% of coastline is owned by Aboriginal people
- Increasing involvement in fisheries management, resource protection and commercial development
- Aboriginal Coastal Licence
  - Expanded in 2020
  - Range of gear types
  - Only used in localised area with permission of Traditional Owners
  - 5 tonne annual catch cap per licence

### Outcomes

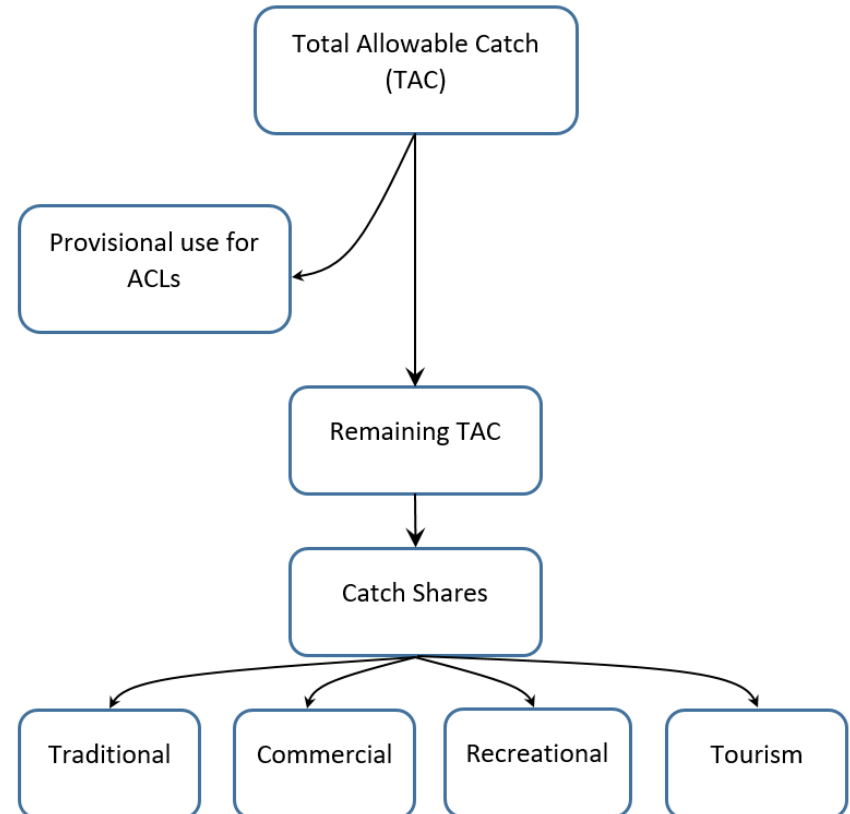
- Providing social, health, economic and cultural benefits





## Incorporation into Management Frameworks

- Aboriginal Coastal Licence.
- Designed to be a 'stepping stone licence'.
- Not intended to compete with commercial licences.
- Still in development phase.
- Expect to understand fishery resource use in next 5-10 years.
- Flexible approach to incorporate into broader fisheries management and account for changing resource use until formal allocation can be determined.







PÊCHE CÔTIÈRE  
ET AQUACULTURE





PROTEGE



Financé par  
l'Union européenne



Pacific  
Community  
Communauté  
du Pacifique



WALLIS ET FUTUNA



REPUBLIQUE  
FRANCAISE  
NOUVELLE  
CALEDONIE



POLYNÉSIE FRANÇAISE



ÎLES PITCAIRN