



Fishing and Fisheries Research Centre



Will diversity assist adaptability?

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Background

- Traditional fisheries management
 - Few, larger operators
 - Targeting one or a few species
 - Minimise effort shift between fisheries / areas
- Managing for adaptation
 - Diverse operation types
 - Targeting and marketing multiple species
 - Ability to shift effort between fisheries / areas





Case study

How does diversity assist adaptation?

- Case study:

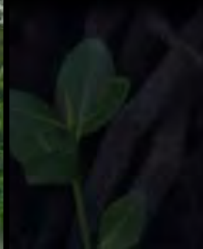
Queensland east-coast inshore finfish fishery (Australia)

– “The Inshore Fishery”



- Inshore habitats

- bays, creeks, estuaries





Case study

How does diversity assist adaptation?

- Case study:

Queensland east-coast inshore finfish fishery (Australia)

– “The Inshore Fishery”



- Inshore habitats
 - bays, creeks, estuaries
- Commercial set net





Case study

How does diversity assist adaptation?

- Case study:

- Queensland east-coast inshore finfish fishery (Australia)

- “The Inshore Fishery”



- Inshore habitats
 - bays, creeks, estuaries
- Commercial set net
- Charter and recreational line
- Multiple species
 - Main = barramundi
- Driven by rainfall and freshwater flow – variable year-to-year



Case study

How does diversity assist adaptation?

- **Case study:**

- **Queensland east-coast inshore finfish fishery (Australia)**

- “The Inshore Fishery”
- Commercial net (~200 active vessels)
- Charter line (230 vessels)
- Socio-economic indicators
 - Working with managers and fishers
 - Monitor success of fisheries management goals
 - Including “**DIVERSITY**”





Case study

- Indicators of adaptive capacity
 - Demographics:
 - Years of experience
 - Investment and debt
 - Patterns of use:
 - Fishing area / range
 - Species number targeted
 - Fishery number





Case study

Indicator

Commercial

Experience

Average 28 years

Investment

Low

Boats ~\$26,000 replacement value

Debt

Low to zero (83%)

Fishing range

Furthest = 1,450 km

Median = 88 km

Target sp

Multiple

Many secondary

fisheries

1 to 6;

7% solely dependent on inshore fishery.





Case study

Indicator	Commercial	Charter
Experience	Average 28 years	8 yrs
Investment	Low Boats ~\$26,000	Medium Boats ~\$50,000
Debt	Low to zero (83%)	Low to zero (55%)
Fishing range	Furthest = 1,450 km Median = 88 km	Furthest = 1,705 km Median = 55 km
Target sp	Multiple Many secondary	75% Barramundi Very few secondary
# fisheries	1 to 6; 7% solely inshore	1 to 2; 70% dependent on inshore





Hypothetical



- Hypothetical scenario:
 - Focusing on barramundi
 - Increased water temperatures
 - Sporadic rainfall in the north – no freshwater flow
 - Barramundi move south





Hypothetical



- Hypothetical scenario:
 - Focusing on barramundi
 - Increased water temperatures
 - Sporadic rainfall in the north – no freshwater flow
 - Barramundi move south
 - Disappear from Cairns north
 - Change in species composition in the north of Queensland
 - How do these fisheries react?





Hypothetical



Commercial fishers

Option 1) Move

- 45% range >100 km
- 12% range >500 km





Hypothetical



Commercial fishers

Option 1) Move

- 45% range >100 km
- 12% range >500 km





Hypothetical



Commercial fishers

Option 2) Change species

- All target and market multiple species
- Whiting, bream, etc...





Hypothetical

Commercial fishers

Option 3) Change fisheries

- 93% operate in multiple fisheries





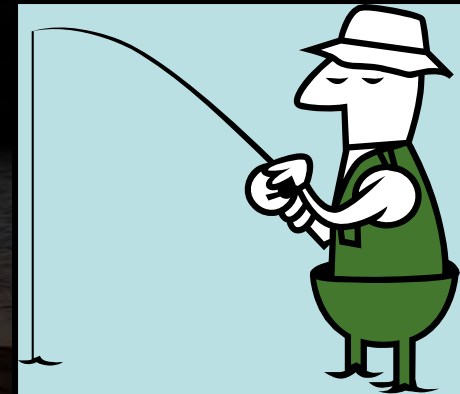
Hypothetical



Charter fishers

Option 1) Move

- 35% range >100 km
- 21% range >500 km





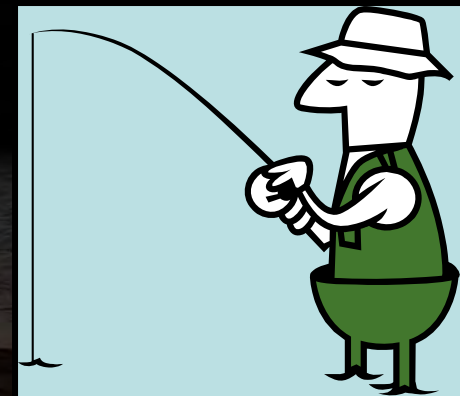
Hypothetical



Charter fishers

Option 1) Move

- 35% range >100 km
- 21% range >500 km





Hypothetical

Charter fishers

Option 2) Change species

- 75% dependent on barramundi
- Highly specialised vessels





Hypothetical



Charter fishers

Option 3) Change fisheries

- 70% dependent on inshore
- Highly specialised vessels





Result



- Adaptive capacity

- Commercial:

- Can move
- Can change species
- Can change fisheries

- Low investment and debt – can restructure

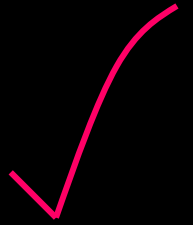
- Charter:

- Some can move
- Most can't change species
- Most can't change fisheries

- High investment – hard to restructure

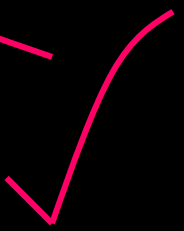
- Young, high education, training, previous employment, low household dependence on fishing

Socio-ecological
resilience



~~Socio-ecological
resilience~~

Social
resilience





Conclusion

- To keep a fishery, need socio-ecological resilience
 - Commercial inshore fishers – yes
 - Longevity of experience
 - Variable environment
 - Learn from them?
 - Diversity
 - Harder to manage – issues of effort shift
 - Need to find way to:
 - keep diversity = adaptive capacity
 - without compromising sustainability





Thank you!



Australian Government
Fisheries Research &
Development Corporation

Questions?

Thanks to all the Queensland fishers who put up with
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