

The effect of ecology, life histories and human pressure on marine fauna management

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Questions

- What is the current abundance and how does this compare with historical data?
- How does their distribution and abundance relate to human pressure (i.e. is there a decline from fishing pressure?)
- Are management strategies adequate to conserve species?



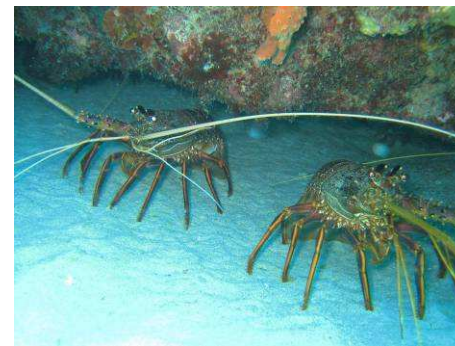
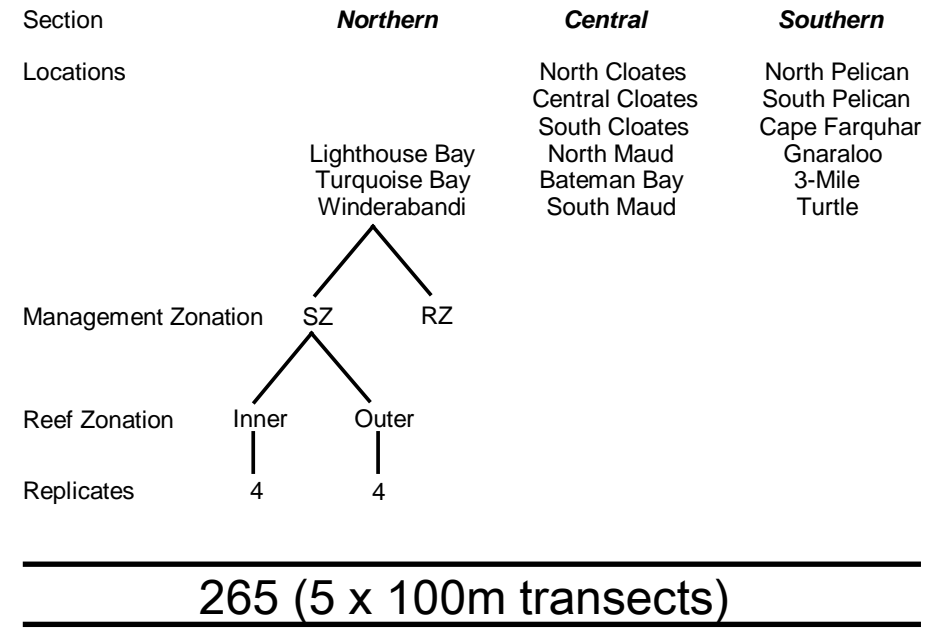
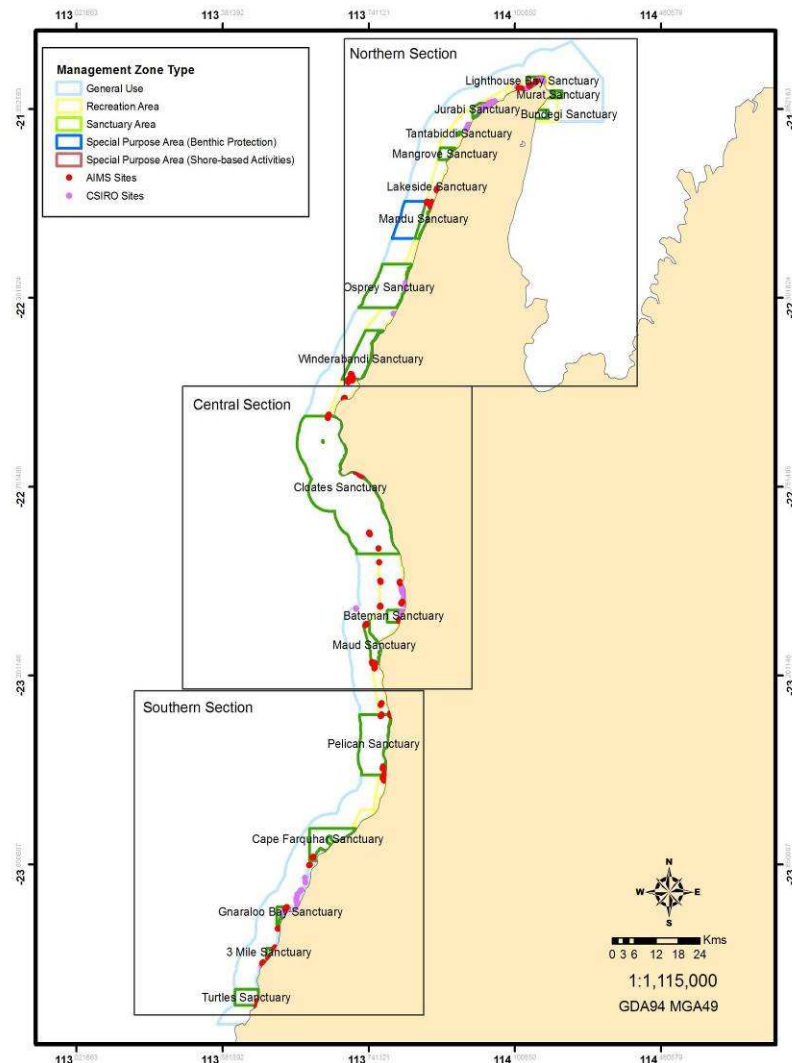
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Outline

- What is the current abundance and how does this compare with historical data?
- Synergistic effects that may affect a species vulnerability and stress the usefulness of science to underpin management decisions and strategy
- Why should we care?
- Management strategies
- Conclusions



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Results

- 5 different species
- Significant effect detected between sanctuary / recreational zones but not for inner / outer reef zones
- Pockets of higher abundance in park
- 132 animals in 13ha / 133km² survey area



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“The first fifteen years it never changed – it was always good – every year was a good year – it was fantastic, absolutely fantastic. I noticed one day we got seven hundred and fifty pounds of crayfish in two and a half hours... and it was all in one reef about two, three hundred feet long”. Nick Farinaccio – commercial cray operator 1960’s, 70’s and early 80’s (from Mack 2003)

“In those days we could get three or four hundred pounds of crayfish a day and we worked up to twelve months a year”. Nick Farinaccio – commercial cray operator 1960’s, 70’s and early 80’s (from Mack 2003)

Martial: “What was your average catch for the day? Like a reasonable day, how many kilos between you and your mate? One of two teams..”

Len Annabel: “**probably over a hundred odd kilos...**” Len Annabel - commercial cray fisher, 1974

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6 days / week x 200 crays / day x 26 weeks / year
= 31,200 rock lobsters / year for decades

“I thought, after Nick gave the licence back to CALM. I could go back ten years later, you’d think there would be heaps...” Len Annabel - commercial cray fisher, 1974

What went wrong and why are they not recovering?

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Ecological

- distribution and habitat association predictable
- spatially clumped

Life history

- very complex
- maturity @ 5 yrs

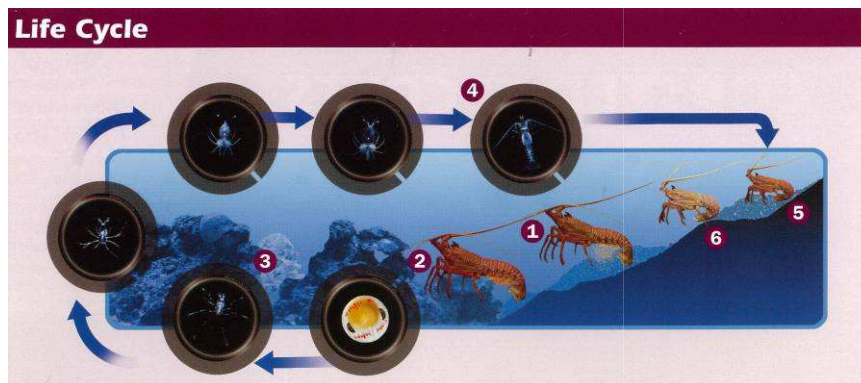
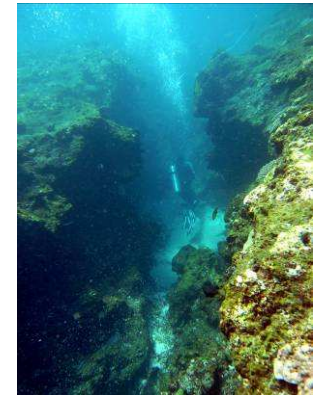


Image from Department of Fisheries WA

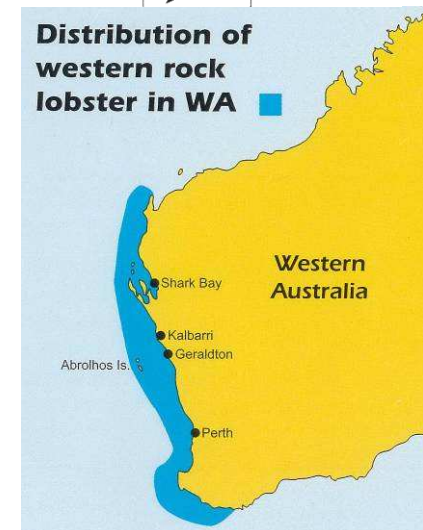
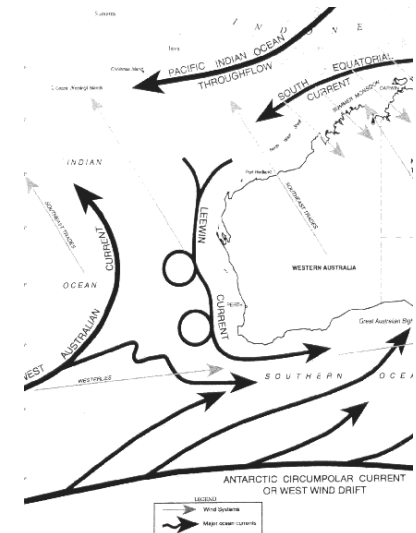
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Oceanography

- Leeuwin currents

“The major impact of the south-flowing Leeuwin Current on the puerulus settlement at this time is felt in the southern most zone of the fishery (around Cape Mentelle) which receives very little settlement unless the Leeuwin Current strength is above average.”

- Climate change scenario



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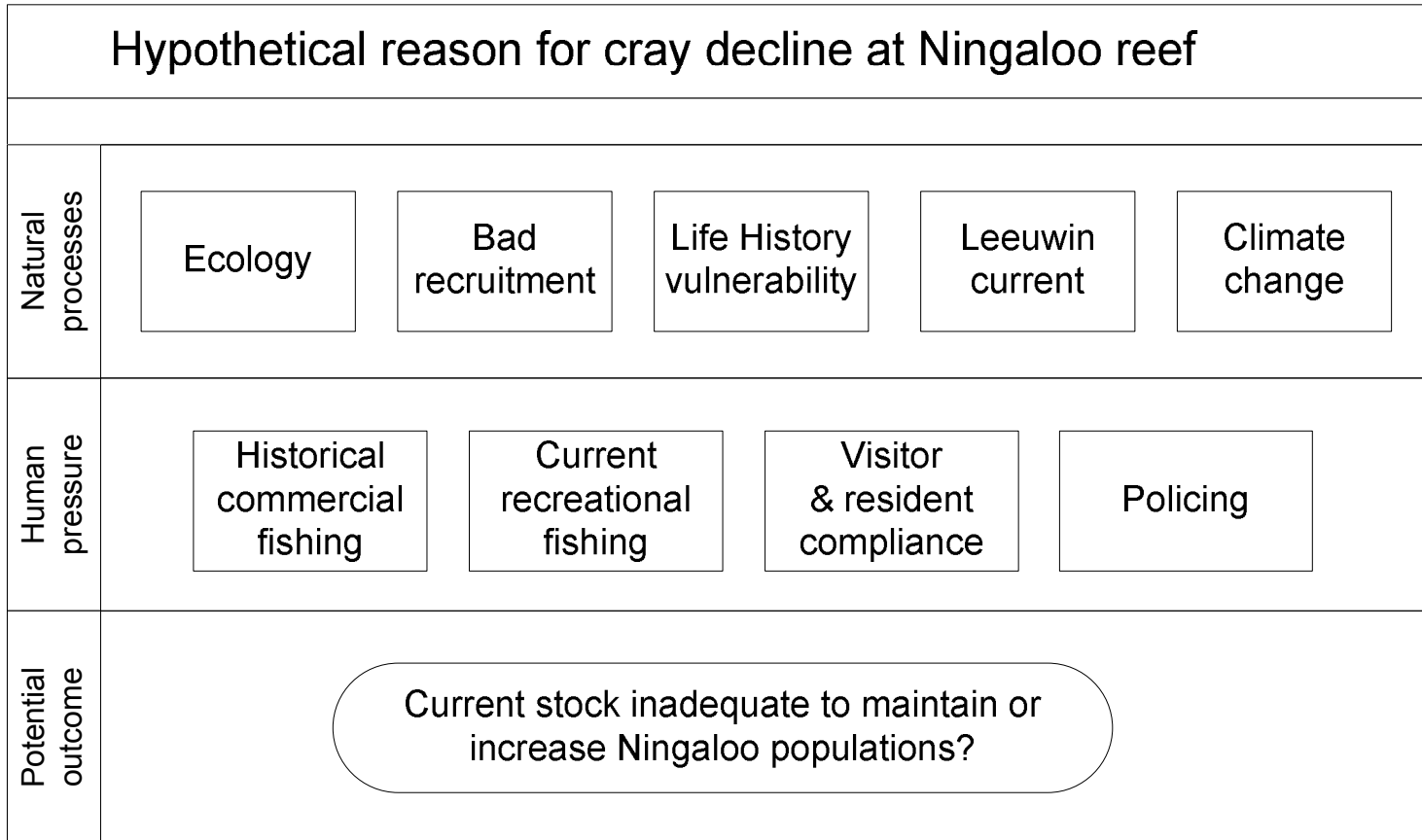
Human-pressure

- increasing numbers of visitors
- more boat ramps & access points, better equipment
- inter-generational right, tragedy of the commons, “secret spots”



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What went wrong and why are they not recovering?



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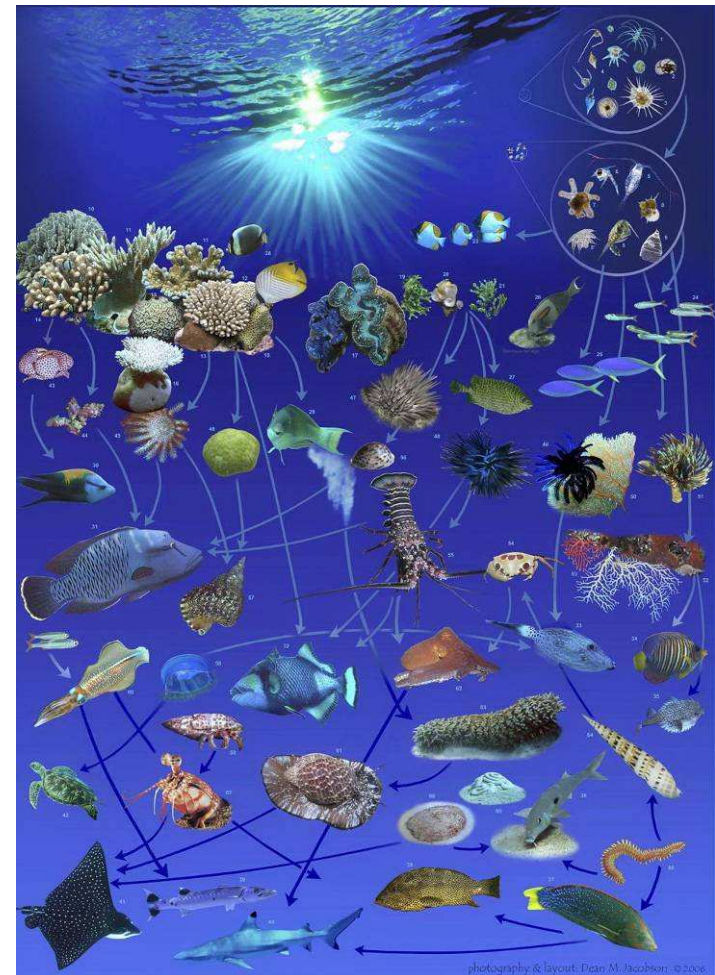
So why should we care?



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Potential consequences of these declines

- ecosystem effects
 - sediment reworking, omnivorous predators of both live and dead plant and animal products (Joll & Phillips 1985)
 - consumers at apex of detrital food chain and base of predatory food chain
- tourism & fishing – commercial fishing gone, cray diving, aesthetic value
- management
 - loss of park biodiversity through localised extinction
 - example of ineffective management of an iconic WA species?



Concluding remarks

Rock lobsters

- A shadow of their former glorious numbers and carrying capacity
- May be many contributors but human intervention significant impact
- Current management strategies inadequate for conserving at least this species
- Appropriate and ongoing monitoring critical to determine population

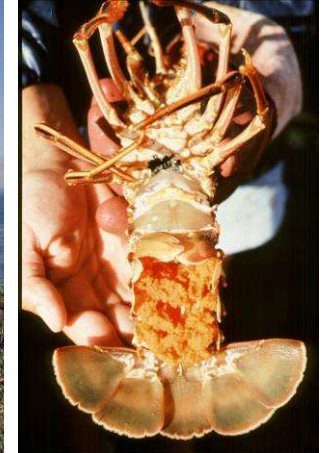
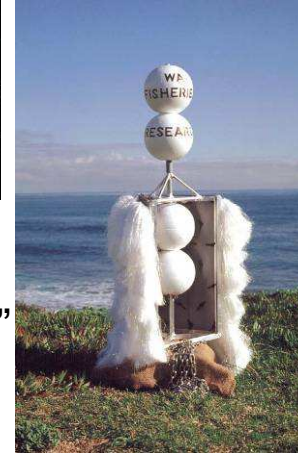
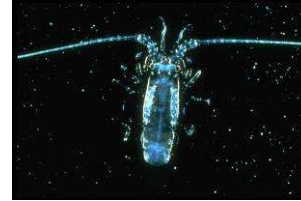
Octopus

- Unknown quantity in comparison but vulnerable habits
- Emphasis on understanding their life histories to assess their vulnerability

Overall, both these animals are very vulnerable to human exploitation

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Management strategies



Rock lobsters

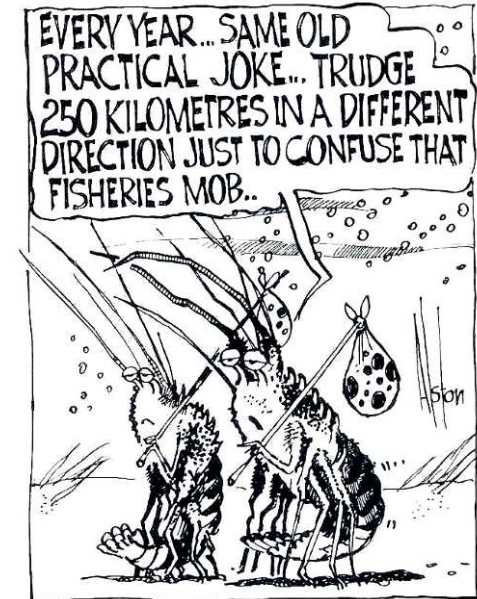
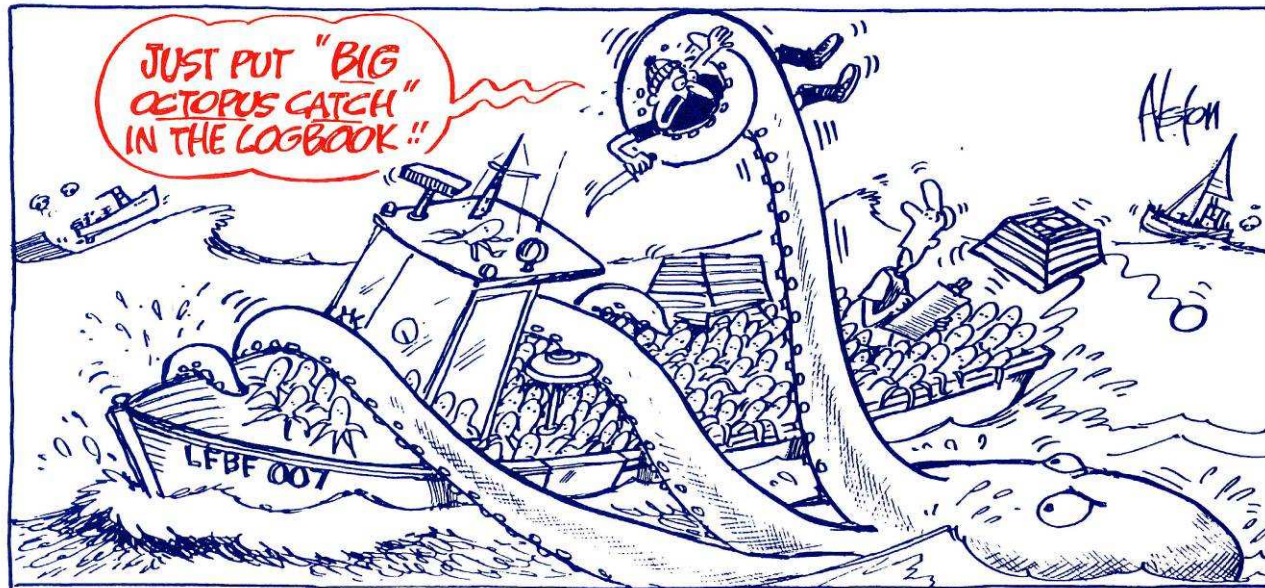
- Continued monitoring of Ningaloo lobster “hotspots”
- Continued monitoring of gravid females in the park
- Puerulus collectors to closely monitor larval input into Ningaloo

Octopus

- Ecology and biology not well known
- Emphasis should be placed on understanding their life histories to assess their vulnerability at this early stage



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Questions?