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Risky facilities: Illegal fishing in the natural environment

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Crime and Risky Facilities

- Crime is not evenly distributed across space/ time
- Most places (and facilities) have little or no crime – but a few produce LOTS of crime

WHY?

- Physical design
- Deficient guardianship
- Surplus of offenders
- Inadequate handling
- Easy accessibility
- Many targets
- Presence of hot products

Wildlife Crime

‘acts committed contrary to national laws and regulations to protect natural resources and to administer their management and use’

– ICCWC

Wildlife Crime

- Wildlife crime is a significant global problem
- Drives social, cultural and political conflict
- Undermines sustainable development

EXAMPLE:

Poaching – '<u>the illegal taking of wild flora and fauna for some purpose</u>'

- Poaching and trade of iconic species – Elephant, Rhino etc
- Illegal Unreported Unregulated (IUU) Fishing
- Hunting for bush meat (local markets)
- Recreational fishing in protected areas (*the focus of analysis in this presentation*)

Wildlife Crime: Law of Crime Concentration

Studies have shown:

- That elephant poaching in Kenya tends to be clustered spatially near roads and waterholes, and temporally during the dry season (Maingi et al., 2012).
- 90% of Rhino poaching in Kruger National Park occurs within 2.5km of a road (Eloff & Lemieux, 2014).
- Illegal fishing in the Cocos Island was concentrated on a seamount and seasonal (Gonzalez-Andres et al 2020).

Wildlife Crime:
Routine Activity and Crime Pattern Theory

Poaching hotspots emerge from the complex biological-social system that influences **how, when and where individuals engage with their environment**

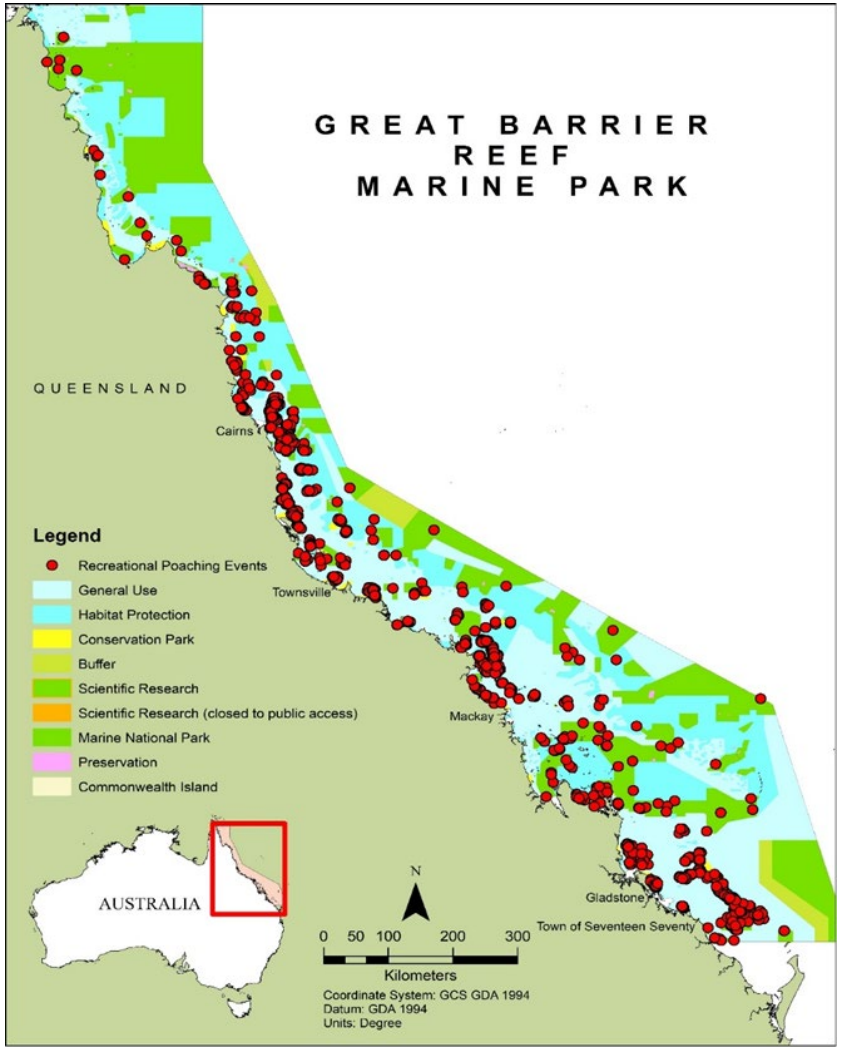
(Hill, 2015).

Natural Environments: Risky facilities?

STEP 1 → EXAMINE THE SPATIAL DISTRIBUTION OF OFFENCES?

RQ 1. Does the distribution of poaching activity follow the "iron law" of troublesome places (80/20 rule)?

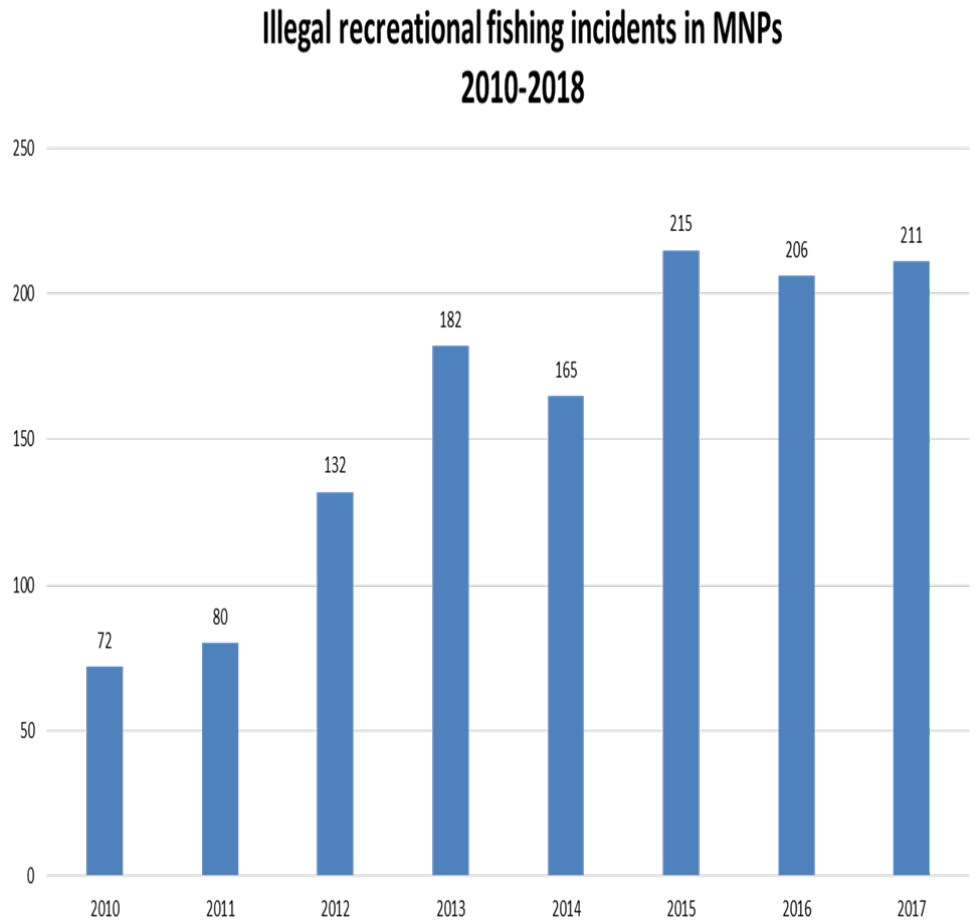
RQ 2. Can factors associated with opportunity (awareness space, crime generators, crime attractors) be used to identify characteristics of spatial risk associated with poaching in the GBRMP?



Map. The Great Barrier Reef Marine Park (GBRMP) in Australia (with zoning plan).

Poaching in the Great Barrier Reef

- Over 200,000 people fish in the GBRMP each year
- Illegal recreational fishing in no-take MNPs is the most frequently reported offence in the GBRMP
- Resource intensive compliance problem
- Increased dramatically post 2012 – increased surveillance priority
- No signs of decline



Hot Spots for Recreational Poaching in the GBR

The distribution of poaching in the GBR is similar to other forms of crime

- 80% occurs in just 20% of zones

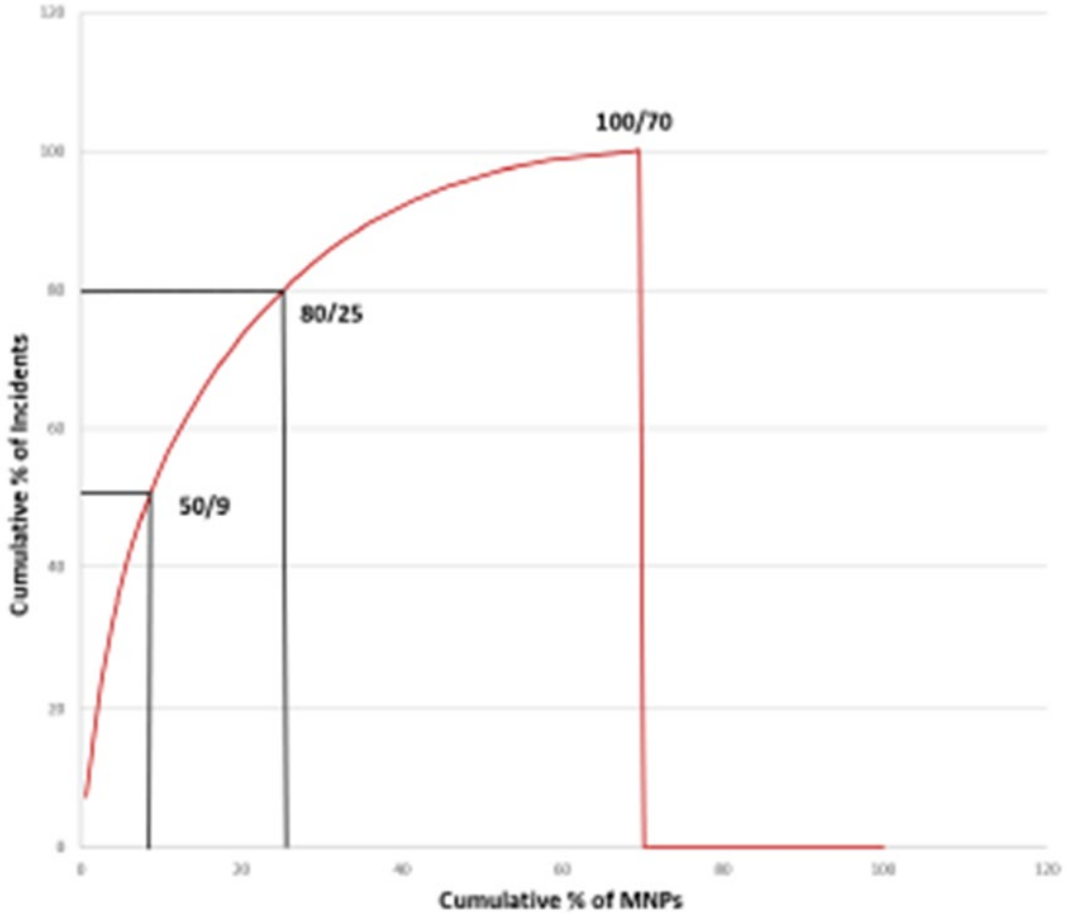
(~32 MNPs)

- 50% occurs in just 8.1% of zones (~13 MNPs)

In 2017:

- Less than 50% of poaching occurred in 10 MNPs

Fig. 1 Distribution of poaching in GBRMP



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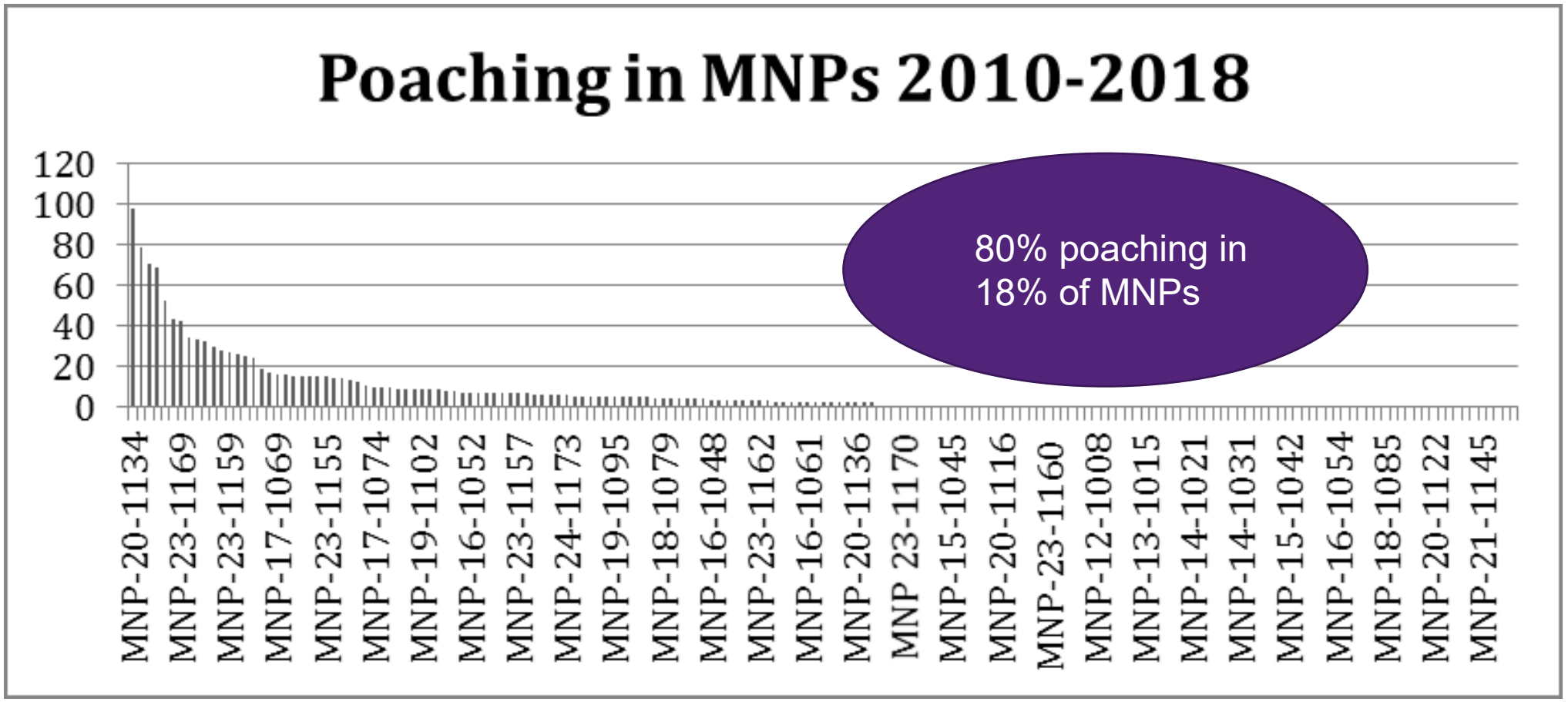
Distribution of poaching within Marine Parks (2010 -2018)

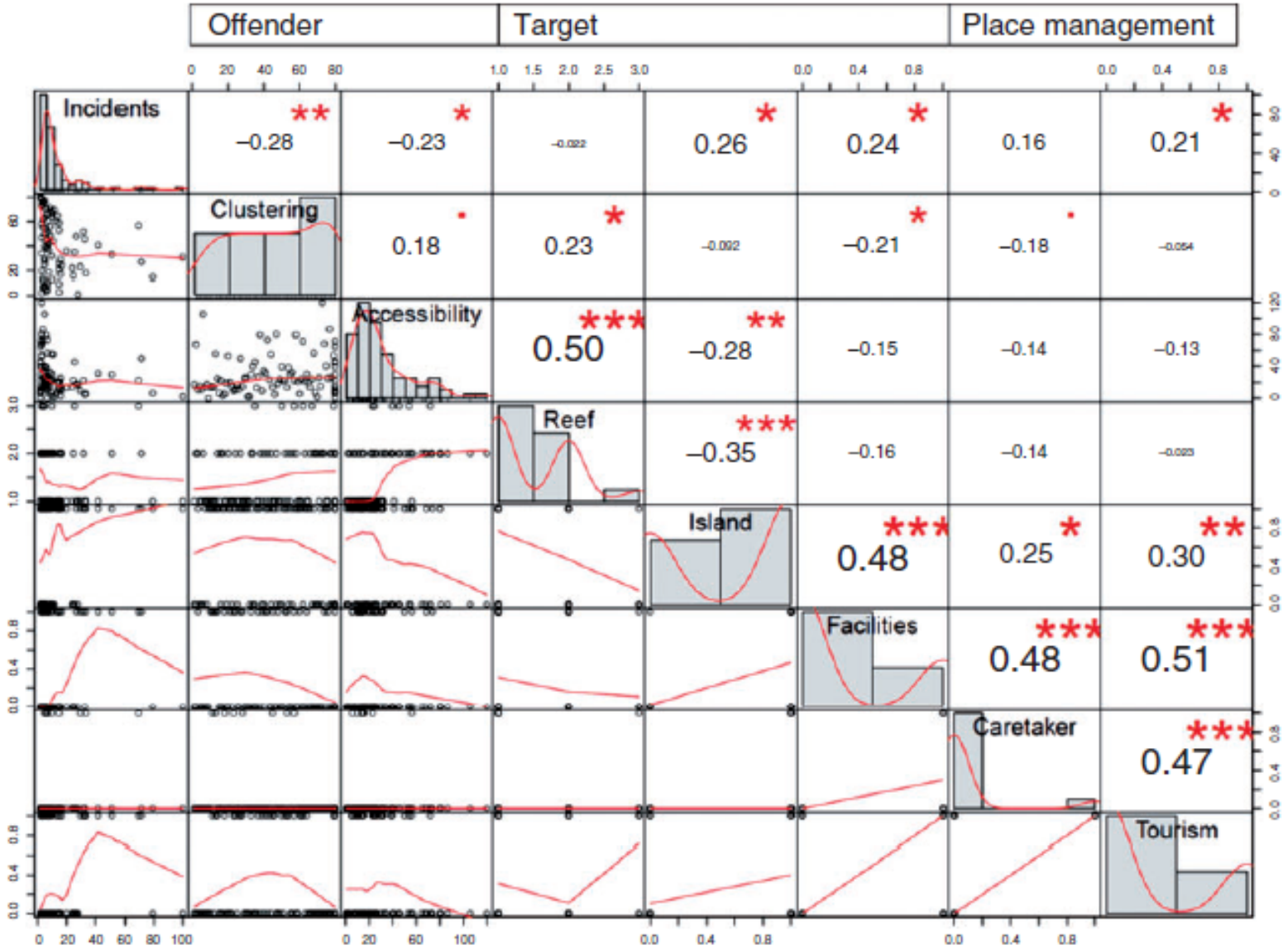


Why are some Marine Parks poaching hotspots?

Risky facilities……

- Accessibility?
- Many targets?
- Low guardianship?
- Physical design?

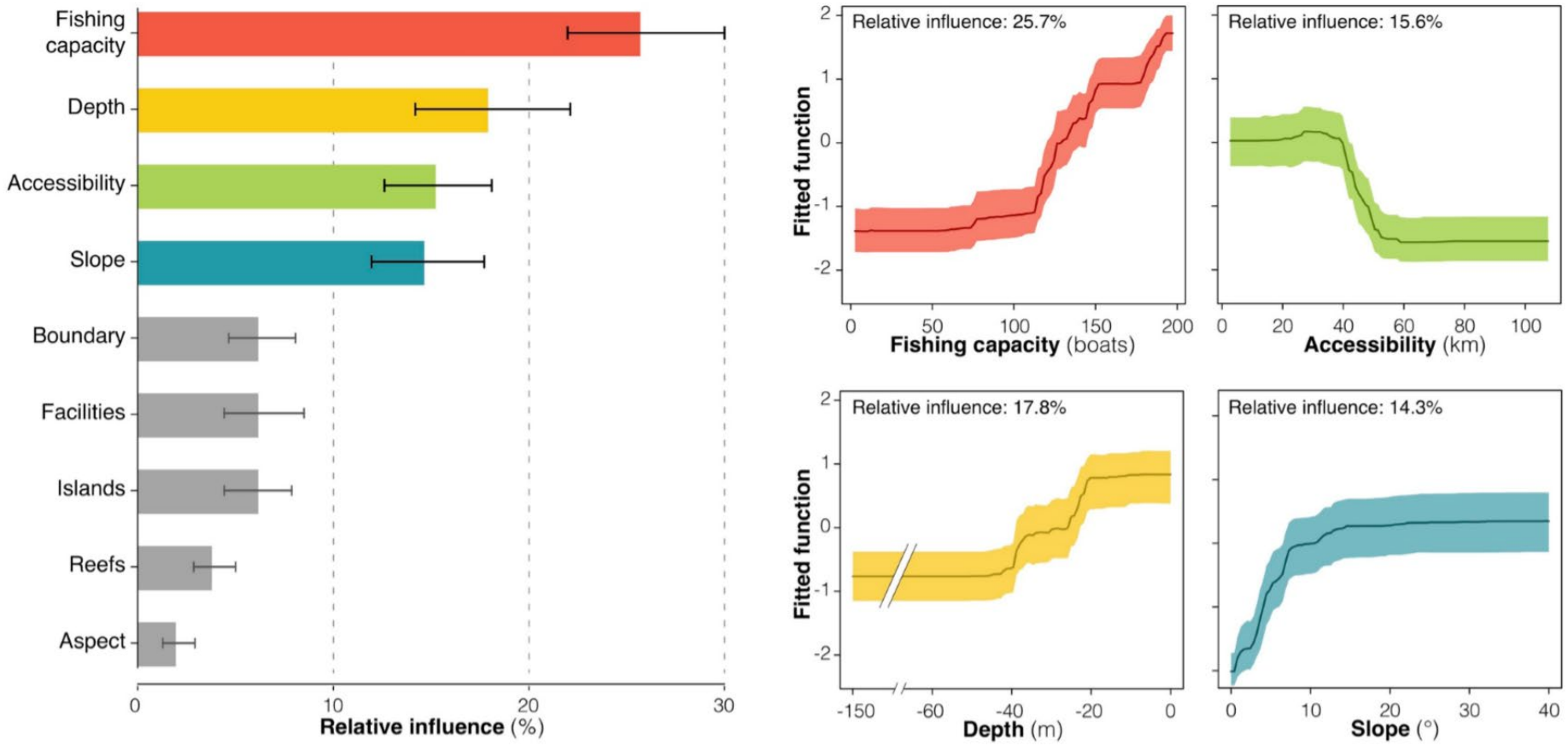
Marine Parks as Risky Facilities?



Clustering of poaching associated with:

- Within **awareness spaces** of legitimate users (rec. fishers)
- **Accessible** (nearest MNPs to boat ramps)
- **Many targets** (islands and reefs)

Risky features of poaching hotspots



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Can we apply risky facilities framing to natural features?

ACCESSIBILITY

- Poaching is clustered marine parks near access points (boat ramps)
- The risk of poaching decreases with distance from an access point – distance – decay effect!

CRIME ATTRACTORS

- The risk of poaching increases as the availability of target reef area increases.
- The risk of poaching increases with the presence of attractive features (reefs)

CRIME GENERATORS

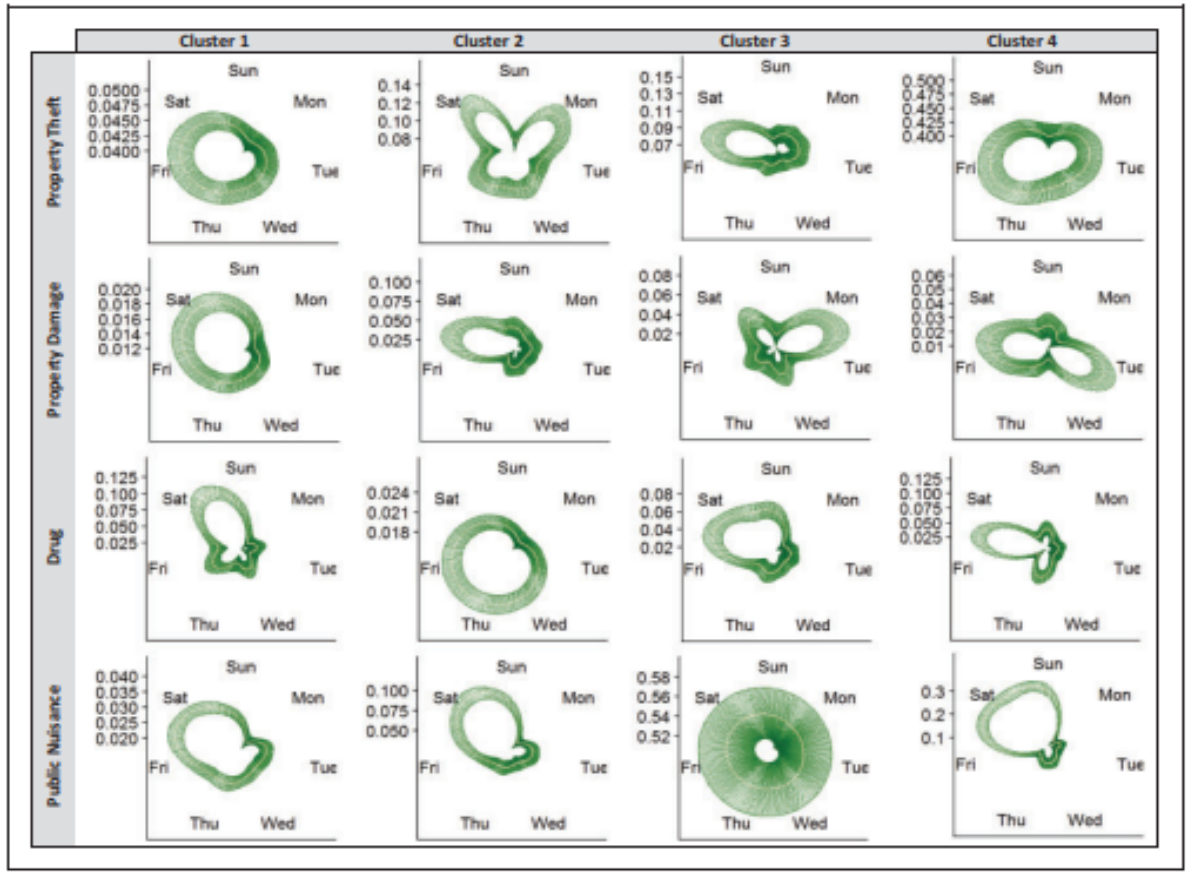
- Poaching occurs in areas that form part of routine activity spaces within the GBRMP, near legitimate activities and where they are most familiar with opportunities (crime generators).

Poaching concentrates spatially at “risky marine parks”

So what about temporal patterns of poaching?

Risky facilities: risky times

Commercial Precincts – Example of time-crime distribution



- Opportunities at risky facilities are unevenly distributed across time
- Commercial facilities different temporal crime profiles for different types of crime
  - High risk theft weekdays
  - High risk nuisance weekend nights

POACHING IN MARINE PARKS?

- Day of the week & time of day
- Season and weather

Weekly crime distribution by 'type' of commercial precinct with 95% error bars.

Corcoran J, Zahnow R, Kimpton A, Wickes R, Brunsdon C. The temporality of place: Constructing a temporal typology of crime in commercial precincts. *Environment and Planning B: Urban Analytics and City Science*. 2021;48(1):9-24. doi:10.1177/2399808319846904

Poaching Risk Temporal Factors

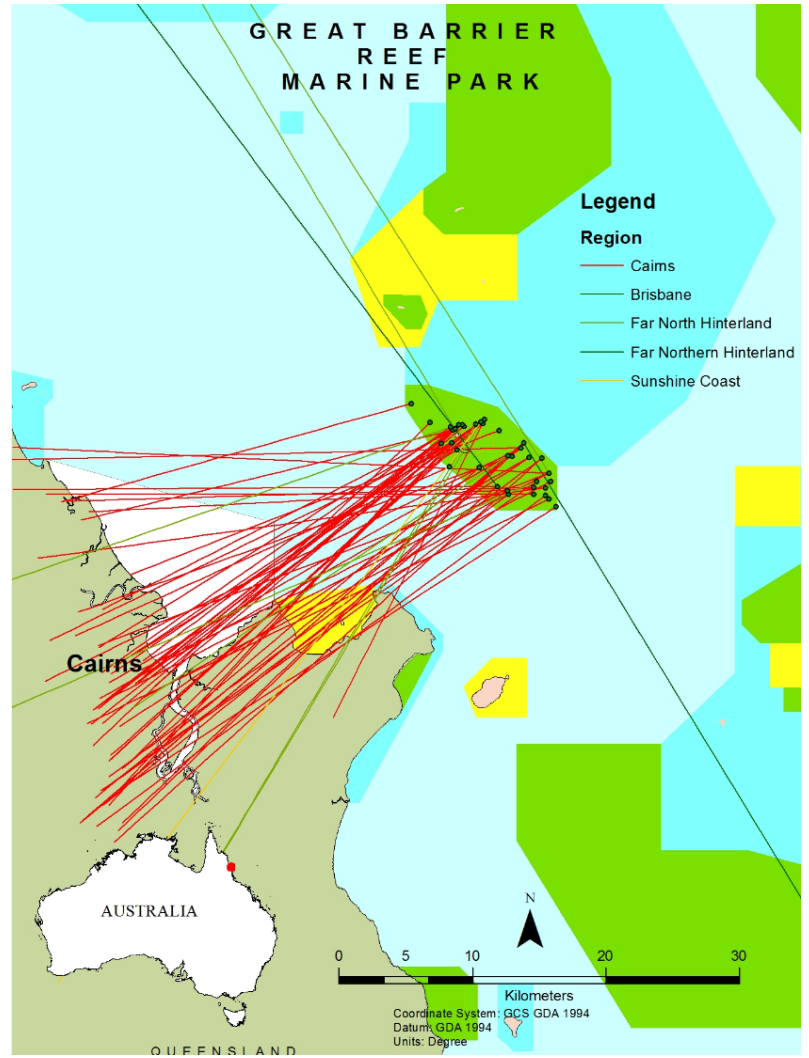
- Poisson time series regression to identify monthly and daily variations in poaching risk
- Weekends → Saturdays highest risk days
- Poaching seasonally clustered → September most risky (but some variation across the GBR)
- Near-repeat patterns similar to burglary → highest near repeat patterns occurred within one week and 1000m of the original event. (using Near Repeat Calculator (Ratcliffe https://www.jratcliffe.net/)

Accessibility & offender target selection

- Target selection → distance-decay function
- Offences occur within offender awareness spaces
- Shortest distance on land from offender residence to access point (boat ramp)
- Shortest distance from boat ramp to suitable reef fishing area (no-take zone)

→ Poachers in no-take MNPs in Cairns region are 4.84 times more likely to be residents of Cairns than any other region ($n = 127$, $p < 0.001$).

→ Offenders in Gladstone no-take zones are 7.22 times more likely to be residents of Gladstone than any other region ($n = 66$, $p < 0.001$)



Weekers, D., Zahnow, R., & Mazerolle, L. (2019). Conservation Criminology: **Modelling Offender Target Selection for Illegal Fishing in Marine Protected Areas**. *British Journal Of Criminology*, 59(6), 1455-1477; Weekers, D., Zahnow, R., & Mazerolle, L. (2020). **Space-time patterns of poaching risk: Using the near-repeat hypothesis to inform compliance enforcement in marine protected areas**. Biological Conservation, 248,

Offender Travel Patterns and Target Selection

Even when offenders appear to travel long distances; fishers use the boat ramp that provides nearest access to suitable fishing target areas from their place of residence.

- Must consider *distance* and *accessibility*
- No offenders with a suitable target area within their region of residence (awareness space) used a boat ramp located further away
- Marine parks defined as “risky facilities” in our previous study tend to be those nearest to access points commonly used by offenders
- Accessibility to targets key consideration in selection
- *Poaching in the GBRMP exhibits similar distance-decay patterns to those seen in other forms of crime*

Applying a risky facilities framework to wildlife crime: benefits

- Knowledge and tested crime prevention techniques used in traditional forms of crime can be applied to compliance management in protected areas
- SCP techniques provide pragmatic low-cost, evidence-based solutions to wildlife crime
- **Poaching is a highly localized activity** and there is a strong relationship between where people live and the specific no-take zones where they poach
- Using this information, undertake **micro-targeted media campaigns** that directly address the wildlife crime problem in highly poached MNPs to specific groups of people based on where they live.
- **Effective, local stakeholder engagement** could have beneficial conservation outcomes

The application of risky facilities framework to poaching provides a pathways to prevention!

Summary

- Opportunity is a key driver of poaching in the GBR
- Poaching is concentrated in a small number of MNPs
- Risky MNPs share a set of common features
- Risk at MNPs is dynamic (time, day, weather, season, tides, sea level)
- Offender's target MNPs: distance-decay; accessibility
- We can use this knowledge to inform prevention management strategies

Australian Government
Great Barrier Reef Marine Park Authority

24-HOUR HOTLINE
PROTECT YOUR PATCH
1800 380 048

Queensland Government

HELP PROTECT THE REEF

Report poaching and other suspected illegal activity

24-HOUR HOTLINE: 1800 380 048 OR WWW.GBRMPA.GOV.AU/REPORT-AN-INCIDENT

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Great Barrier Reef Marine Park Authority

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WHITSUNDAYS - YOUR SPECIAL PATCH OF THE REEF

WHY IS THE WHITSUNDAYS SPECIAL?

- Turtle foraging habitats
- Calving grounds for whales and dolphins
- Historic heritage sites
- Culturally significant sites
- Spectacular scenery

GREEN ZONES = NO FISHING

DON'T RISK A $2100 FINE

REPORT + PROTECT = 1800 380 048

REPORTING TIPS:

WHO?
Vessel identity
Name and registration number of offending vessel

WHAT?
Brief description of activity
If possible and practical, photos can be supplied

WHEN?
Time and date of incident

WHERE?
Provide the nearest landmark, reef or coordinates

WHY?
Poaching from no-take green zones impacts us all.
It threatens the health and resilience of the Reef.
Reports can be made anonymously.

2019-0367

HELP PROTECT THE REEF 24-HOUR HOTLINE 1800 380 048 OR WWW.GBRMPA.GOV.AU/REPORT-AN-INCIDENT

References

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