

Section I. Questions from the expert-elicitation survey of bright and dark spot conditions.

**How would you rank the level of dependence on coral reef fisheries?**

- High (a majority of local residents depend on reef fish as a primary source of food or income)
- Medium (some local residents depend on reef fish as a primary source of food or income, and a majority engage in reef fisheries as a supplemental or recreational activity)
- Low (reef fisheries are largely a supplemental or recreational activity for local people)
- My site is remote, so this is not applicable
- Don't know

**Are there any taboos/cultural preferences/norms, or other social structures that restrict people's use or consumption of reef fish? This might include the types of fish people can eat, who is allowed to access reefs, or when people can access reefs**

- Yes
- No
- Don't know

**Are there marine tenure systems in place that limit how some fishers can access this site?**

- Yes
- No
- My site is remote, so this is not applicable
- Don't know

**How would you rate the level of engagement people have in the management of coral reefs?**

- None- people are unable to participate in coral reef management
- Token- people are only slightly engaged in the management process. This includes consultation, but not active participation
- Significant- there is substantial engagement by local people in management
- My site is remote, so this is not applicable
- Don't know

Please check the types of fishing activities occurring at this site (check all that apply)

	In use	Not in use	Don't know
Trap			
Spear fishing (day)			
Spear fishing (night)			
Hook and line			
Gill net			
Beach seine net*			
Purse seine net*			
Poison			
Blast fishing			
Other (please specify)			

\* comprises 'intensive netting'

Please check the types of fishing vessels in use at this site (check all that apply)

	In use	Not in use	Don't know
None			
Canoe			
Sailing vessel			
Small (<6m) motorised boat (e.g., dinghy, launcha, banana boat)			
Large (>6m) motorised boat			

**Are there fish freezers in use near this site (either on board vessels or on land)**

- Yes
- No
- Not applicable
- Don't know

**Are there deep-water refuges proximate to this site?**

- Yes
- No
- Don't know

Please feel free to elaborate\_\_\_\_\_

**Is this site proximate (e.g., within 5kms) to mangroves?**

- Yes
- No
- Don't know

Please feel free to elaborate\_\_\_\_\_

**Have there been any of the following environmental shocks in the 5 years preceding the survey date?**

- Coral bleaching
- Direct hit from a cyclone
- Tsunami
- King tide
- Earthquake
- Other
- Don't know

Section II. Justification for the use of a noncentral- T distribution and use of 3.5 degrees of freedom.

As a supplemental analysis requested by a technical reviewer to support our use of the noncentral t-distribution with 3.5 degrees of freedom in our full model, we re-ran our analysis but estimated the degrees-of-freedom parameter ( $\nu$ ) explicitly. Specifically we replaced the fixed value of 3.5 in the likelihood with:

$$\log(y_{ijks}) \sim \text{Noncentral}T(\mu_{ijks}, \tau_{ref}, \nu)$$

$$1/\nu \sim U(0, 0.5)$$

as recommended on page 372 of Gelman and Hill<sup>1</sup>. Critically, this parameterization converges to a normal distribution as  $\nu$  becomes arbitrarily large. In effect, this means we modelled the data in a robust way that includes both the noncentral t- and normal distribution forms, allowing the data itself to arbitrate between the two candidate distributions. We found that the posterior distribution of  $\nu$  shows a mode at 3.46 [2.94, 3.99] (Extended Data Figure 3b), which is very strong evidence both for our use of 3.5 as the degrees of freedom parameter and for a noncentral t-distribution, relative to a normal. This suggests that the data are more dispersed than assumed by a Normal distribution, which is why we failed to find strong evidence for convergence when we initially ran the model using a normal distribution.

## Reference

1. A Gelman & DB Rubin. Inference from iterative simulation using multiple sequences. *Stat Sci* 7, 457-472 (1992).