Night setting

20 Feb 2024

WCPFC CMM 2018-03 current options

Option for North Pacific (Column A) and South Pacific (south of 30°S).

A single set of specifications:

i. No setting between nautical dawn and before nautical dusk.
ii. Nautical dusk and nautical dawn are defined as set out in the Nautical Almanac tables for relevant latitude, local time and date.
iii. Deck lighting to be kept to a minimum. Minimum deck lighting should not breach minimum standards for safety and navigation.

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Effectiveness:

- Studies summarised in SC-19-EB-IP-15 consistently found reduced bycatch rates during night setting:

Location	Bycatch rate per 1,000 hooks		Notes	Source
	With measure	Without measure		
Night setting				
New Zealand	0.09	0.28	Day/night ns. Moon phase, as a nested factor of day/night, highly significant.	Duckworth 1995
Hawaii	0.6	2.23	(u)	McNamara et al. 1999
Australia (East coast)	0.38	0.95	(u) Flesh-footed shearwaters only	Baker and Wise 2005
South Africa	0.09	Highest during the day and full moon		Petersen et al. 2008a
Uruguay	Lower	Higher	See Figure 6; note also the significant effect of moon phase.	Jiménez et al. 2009
Uruguay	1.21	5.49		Jiménez et al. 2019a
South Atlantic and southwestern Indian Oceans	Lower	Higher	Also a significant effect of moon illumination.	Jiménez et al. 2020
Pacific Ocean	0 Night-deep	0.19 Day-shallow 0.01 Day-deep	See source for description of 'shallow' and 'deep' gear configurations. 'Day' sets were all sets not meeting the night-setting criteria.	Gilman et al. 2023

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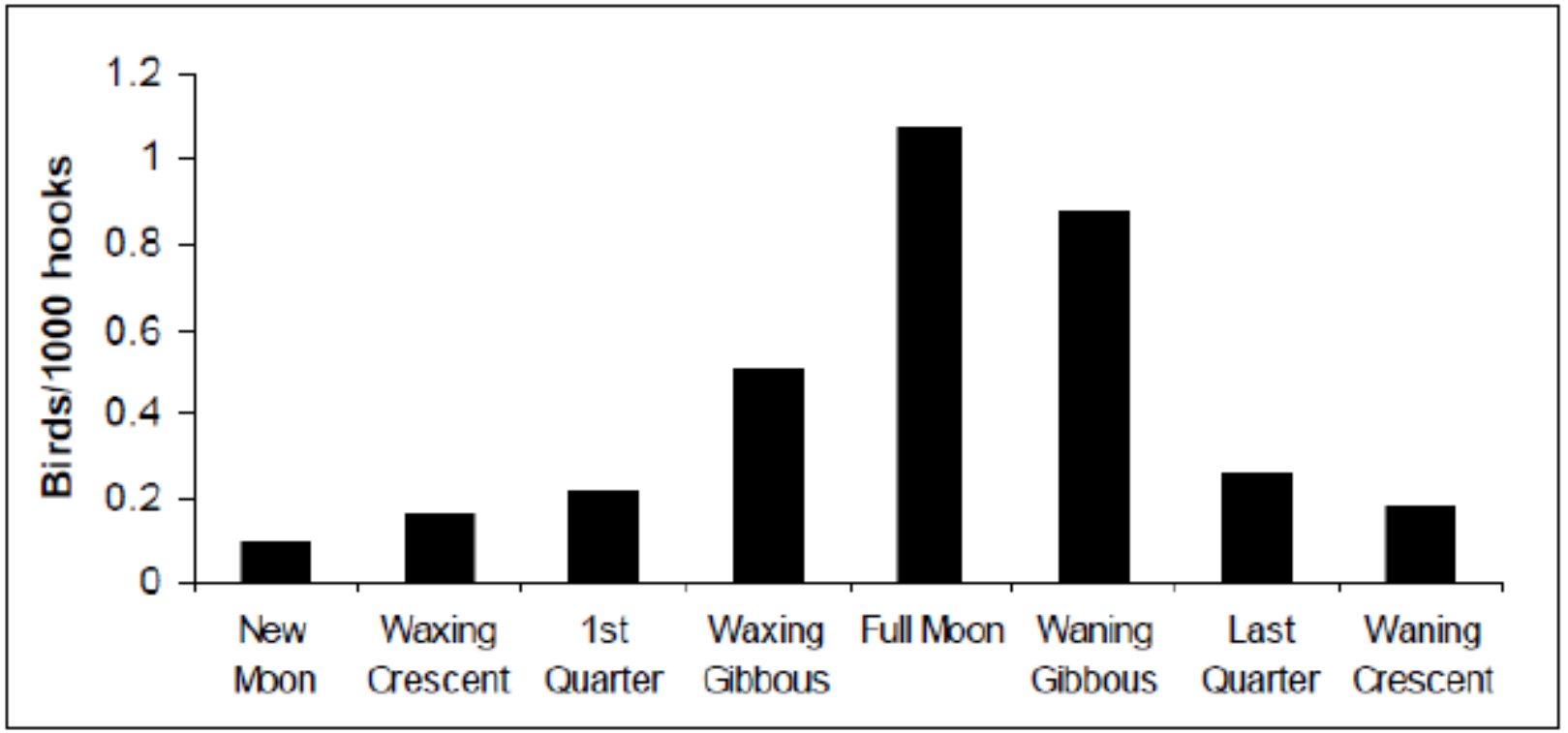
Effectiveness:

- Night setting is known to be less effective when moonlight is bright. For example, Petersen et al (2008), using South African pelagic longline fishery records, summarise the effect of moon phase on seabird mortality:



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Effect on fish catch:

- Few studies have investigated the effect of night setting on fish catch, in the absence of any other seabird bycatch mitigation measure. SC-19-EB-IP-15 noted the following studies:

Effect on fish catch rates	Species	Effect size	Location	Source
No effect	Albacore (SS)		Pacific Ocean	Gilman et al. 2023
Decrease	Tunas (G)	-14 (u)	South Africa	Petersen et al. 2008c
	Swordfish (SS)	-23% (u)	South Africa	Petersen et al. 2008c

SS=Study compared species-specific catch rates, G=Catch rates compared for species groups, 'Day' and 'Night' catch rate information from Petersen et al. 2008c is used, (u)=Statistical significance is not stated in the source reference..

- Melvin et al. (2013) reported increased catch rates, or no effects on catch rates when night setting was used in combination with tori lines.

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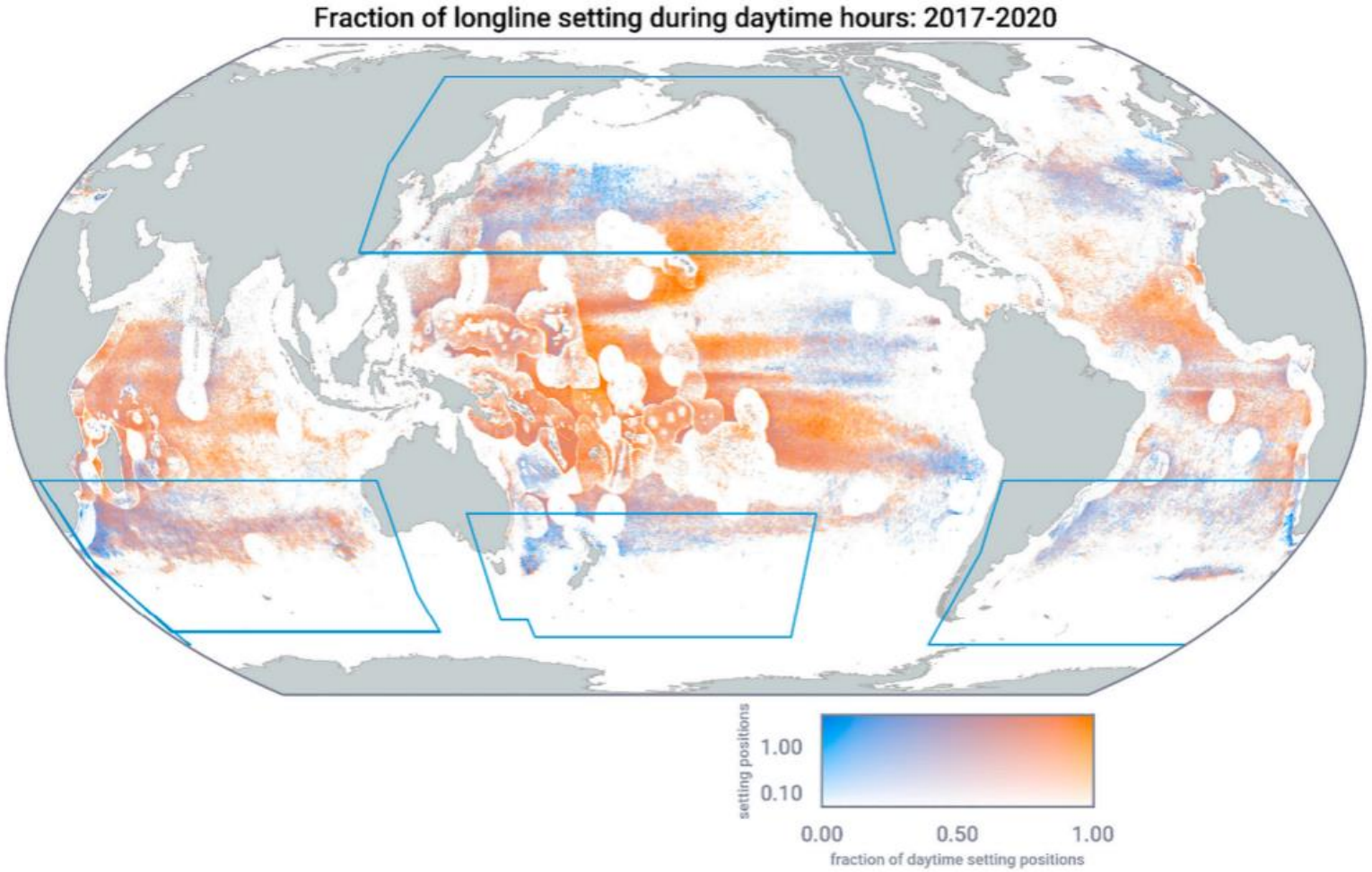
Practical considerations:

- The entire set must be between nautical dusk and nautical dawn.
- Kroodsma et al (2023) found that only 3% of pelagic longline sets globally were set entirely at night.



Kroodsma et al (2023) Figure 2. Blue areas indicate that most setting happens at night, and orange indicates that most setting happens during the day. Bounding boxes represent regions with tRFMO regulations in the South Indian Ocean, North Pacific, South Pacific, and South Atlantic. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

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Practical considerations:

- In addition to moon-lit nights, lightsticks and bright deck lighting may also reduce efficacy of the measure (Brothers and Foster 1997; McNamara 1999; Parker 2017).
- Accordingly, night setting should continued to be used in combination with other methods.

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Wider considerations:

- Artificial light at night is a major threat to seabirds (Dias et al 2019). At sea, disorientation and attraction due to artificial lights can result in seabirds landing on and colliding with the vessel and its superstructure. Birds can succumb due to the direct impact of the collision, due to injuries following the impact, or due to getting waterlogged.
- ACAP have endorsed guidelines for managing artificial light.

Is there any other information on whether minimizing vessel lighting, whilst not breaching minimum standards for safety and navigation, should only occur when using night setting as a seabird bycatch mitigation option?

References

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- Duckworth 1995. Analyses of factors which influence seabird bycatch rates in the Japanese southern bluefin tuna longline fishery in New Zealand waters, 1989-93. New Zealand Fisheries Assessment Research Document 95/26. Ministry of Agriculture and Fisheries, Wellington.
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- Jiménez et al. 2020. Towards mitigation of seabird bycatch: Large-scale effectiveness of night setting and Tori lines across multiple pelagic longline fleets. Biological Conservation 247: 108642.
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- Petersen et al. 2008c. Implications of night setting for seabirds and target catches. In Petersen S.L., Nel D.C., Ryan P.G. & Underhill, L.G. (eds). Understanding and Mitigating Vulnerable Bycatch in southern African Trawl and Longline Fisheries. WWF South Africa Report Series - 2008/Marine/002.