

# Bycatch Mitigation FACT-SHEET 5 (Version 1)

Practical information on seabird bycatch mitigation measures

## Demersal and Pelagic Longline: Night-setting

**Night-setting is one of the few mitigation measures that is equally applicable to both demersal and pelagic longline fisheries.**

### What is night-setting?

Night-setting requires no modification of the fishing gear. It simply requires setting to be started and finished during the hours of darkness, between nautical dusk and dawn.

Setting at night avoids periods when most seabirds are actively foraging. Available information suggests that albatrosses and petrels detect food items at close range by sight and so darkness effectively conceals baited hooks from most foraging seabirds. Additionally, many seabirds, particularly albatrosses, are most active during daylight hours, including dusk and dawn. Data from stomach temperature gauges (Weimerskirch and Wilson, 1992) suggest that wandering albatross, at least, feed primarily during daylight hours and rest at night. This is reflected in bycatch studies, which frequently show that time of day is an important factor affecting the number of birds caught during longline setting (e.g. Baker and Wise, 2005). In particular, dawn and dusk are times when birds are most active and consequently most vulnerable to longline bycatch (e.g. Belda and Sanchez, 2001).

### Effectiveness at reducing seabird bycatch

On moonless cloudy nights, night-setting can be highly effective at limiting seabird bycatch. However, for up to two weeks every month the moon may provide enough light to significantly reduce the effectiveness of night-setting (Klaer and Polacheck, 1998; Petersen, 2008).

### Seabird species

The effectiveness of night-setting is also dependent on the species assemblage. In some instances, where albatrosses compose the majority of bycatch, night-setting can effectively reduce seabird bycatch. Around the Prince Edward Islands, Southern Ocean, experimental trials indicate albatross bycatch rates are ten times higher during the day than at night whereas white-chinned petrel bycatch was halved when setting at night (Ryan and Watkins, 2002). Off the east coast of Australia, where shearwaters predominate, night-setting alone is less effective, although bycatch rates are still lower than day sets (Baker and Wise, 2005).

### Best practice recommendation

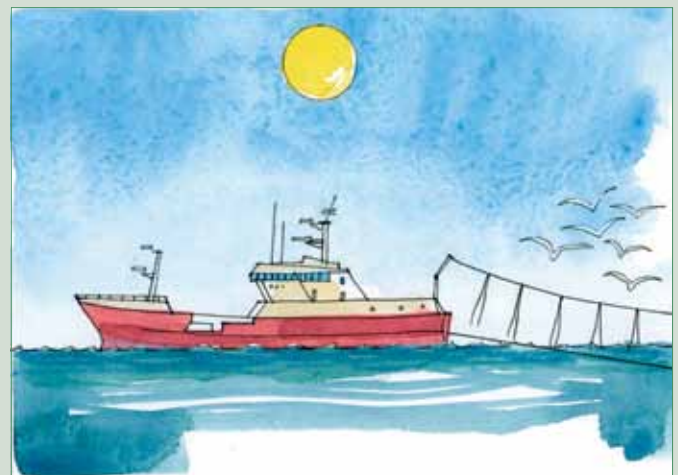
To be effective, vessels should not commence line setting until at least one hour after nautical dusk and should complete setting at least one hour before nautical dawn. Combined with night-setting, deck lights should be kept at the minimum level appropriate for crew safety and directed inboard so the line is not illuminated as it leaves the vessel.

### Potential problems and solutions

- Night-setting is only truly effective on dark nights (i.e. the new moon half of the lunar cycle). On clear nights with a full moon, night-setting becomes far less effective (Klaer and Polacheck, 1998; Petersen, 2008).
- In the highest latitudes during the summer months, the time between nautical dusk and dawn is limited. In these circumstances, fishing opportunities are greatly reduced.



**Figure 1.** At night, seabirds are generally less active and have difficulty locating baits.



**Figure 2.** Seabirds, and albatrosses in particular, are more active during the day.

Careful planning is required to minimise the amount of lost time and the associated cost of lost fishing potential and fuel.

- Depending on the target species, the time of setting may have consequences for the catch rate of target species. This is more likely to be an issue in pelagic longlines where many species undergo daily vertical migrations.
- Night-setting can raise concerns over crew safety. This can be overcome by ensuring adequate deck lighting is in place.

---

## Combinations of measures

Due to variations in the lunar cycle and the ability of some species to forage at night, night-setting is not an effective measure when used in isolation. It is recommended that night-setting is used in combination with a selection of other measures:

- **Line weighting** (Fact-sheets 2, 3, 4 and 8)
- **Streamer line** (Fact-sheets 1 and 7)
- **Blue-dyed bait (squid)** (Fact-sheet 10).

## Further research

There is concern that night-setting may transfer bycatch pressure from seabirds onto other vulnerable bycatch species such as sharks and turtles. Further research is needed to evaluate the effect of setting time on target fish catch and bycatch rates of seabirds, sharks and turtles.

## Compliance and implementation

Compliance with the requirement to set at night can be monitored with onboard observers, and is potentially monitored through VMS and other electronic monitoring of fishing activity. The simplicity and the effectiveness of the measure make it attractive in demersal longline fisheries but the implications for catch and non-seabird bycatch in some pelagic longline fisheries require further investigation.

### References

- Baker, G.B. and Wise, B.S. (2005)** The impact of pelagic longline fishing on the flesh-footed shearwater *Puffinus carneipes* in Eastern Australia. *Biological Conservation* **126**: 306–316.
- Belda, E.J. and Sanchez, A. (2001)** Seabird mortality on longline fisheries in the Western Mediterranean: factors affecting bycatch and proposed mitigating measures. *Biological Conservation* **98**: 357–363.
- Klaer, N. and Polacheck, T. (1998)** The influence of environmental factors and mitigation measures on bycatch rates of seabirds by Japanese longline fishing vessels in the Australian region. *Emu*, **98**: 305–316.
- Petersen, S.L. (2008)** *Understanding and mitigating vulnerable bycatch in southern African longline and trawl fisheries*. PhD thesis, University of Cape Town.
- Ryan, P.G. and Watkins, B.P. (2002)** Reducing incidental mortality of seabirds with an underwater setting funnel. *Biological Conservation*, **104**: 127–131.