BIRDS TRAPPED IN "LIGHT COLUMN" OF FISHING VESSEL OPERATING IN EAST CHINA SEA

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Received 12 January 2026, accepted 20 April 2026

ABSTRACT

Cheng, Y.-C., Lu, Y.-X., Kang, B., Ge, Y.-F., Liu, Y., & Wu, F.-X. (2026). Birds trapped in "light column" of fishing vessel operating in East China Sea. *Marine Ornithology*, *54*(2), 417–419. http://doi.org/10.5038/2074-1235.54.2.1714

We report migratory birds becoming trapped within the column of light emanating from a fishing vessel operating in the East China Sea. On 14 October 2025, a flock of at least 30 small- to medium-sized birds was observed circling continuously within the intense artificial light used by a falling-net fishery vessel. The event illustrates a previously overlooked bird–fishery interaction in this area and suggests that artificial light from fishing vessels may pose substantial risks to migratory birds. These findings underline the need for further light-pollution research at sea to better conserve migrant seabirds.

Key words: artificial light, light falling-net fishery, East Asian Australasian Flyway

Artificial light at night (ALAN) is a major form of pollution that reshapes many biological and ecological processes in both terrestrial and marine ecosystems (Gaston & Sánchez De Miguel, 2022; Marangoni et al., 2022). Juveniles of burrow-nesting seabirds are particularly vulnerable to stranding caused by land-based ALAN (Rodríguez et al., 2017). Light attraction is also an issue at sea. For instance, deck strikes and bycatch mortality have been observed in fisheries that use intense lighting to attract squid to the surface (e.g., Debski & Holmes, 2017). However, in the marginal seas of the Pacific Ocean where artificial lighting for fishing is pervasive and rapidly expanding (Li et al., 2022), direct observations of bird–light fishery interactions at sea remain sparse.

We conducted opportunistic visual surveys during 12–14 October 2025 in the East China Sea (~27°N–28°N, 121°E–123°E; transect length = 525 km), targeting migrating species during the day and lighted fishing vessels during the night. We scanned the sea surface every 20 min during the daytime, recording eight species totaling 675 birds. Streaked Shearwater *Calonectris leucomelas* was the most abundant species (n = 654), while we also recorded migratory land birds, including Medium Egret *Ardea intermedia*, Great Egret *A. alba*, Barn Swallow *Hirundo rustica*, and Eastern Yellow Wagtail *Motacilla tschutschensis*.

During approximately six hours of nocturnal observation, we encountered one light falling-net vessel in operation, with an associated bird flock, passing our vessel in the opposite direction at ~19h30 on 14 October 2025 at 28.63°N, 122.53°E (Fig. 1). Light falling-net vessels use high-power lamps at night to attract phototactic squids and fishes to the sea surface under the hull, then rapidly deploy and close a vertically hanging net beneath the vessel to encircle and harvest the aggregated prey. In the South China Sea, this process has been shown to alter the behaviour of odontocetes by providing additional foraging opportunities (Zhang et al., 2025). The observed fishing vessel was equipped with ~150 metal-halide light bulbs on each side. At least 30 unidentified small- to medium-size birds were circling within the upward-directed light column (Cheng et al., 2026). Similar to when land-based migratory birds have been trapped inside intense light columns at night over land (Van Doren et al., 2017), these birds were circling in fluttering flight within the light from the vessel. Due to safety and logistical constraints, we did not turn around and pursue the fishing vessel.

The observed event aligns with conditions empirically known to facilitate bird attraction to ALAN—i.e., drizzling rain, reduced or absent moonlight, and the migration season (Montevecchi, 2006). Although this incident occurred only once during our observation period, the rapid growth in the number of light fishing vessels in the study area (Li et al., 2022) suggests that such interactions may be more common than currently recognized. Birds circling within light columns face the risk of direct mortality and suffer additional energy expenditure (Montevecchi, 2006). Therefore, ALAN produced by fishing vessels poses a significant threat not only to migratory seabirds such as the Streaked Shearwater but also to large numbers of waterbirds, shorebirds, and songbirds that migrate at night across the open ocean along the East Asian Australasian Flyway (Bai et al., 2025).

In conclusion, we provide direct field evidence of bird–light fishing vessel interaction, demonstrating that fishing vessel lighting can induce behavioral responses in migratory marine and land birds. This phenomenon appears to be substantially under-reported in the western North Pacific, where light fishing vessels are increasing rapidly (Li et al., 2022). Future research should identify affected bird species and compare how different light sources (LED, metal halide, and high-pressure sodium lamps) influence the intensity of bird–light vessel interactions.

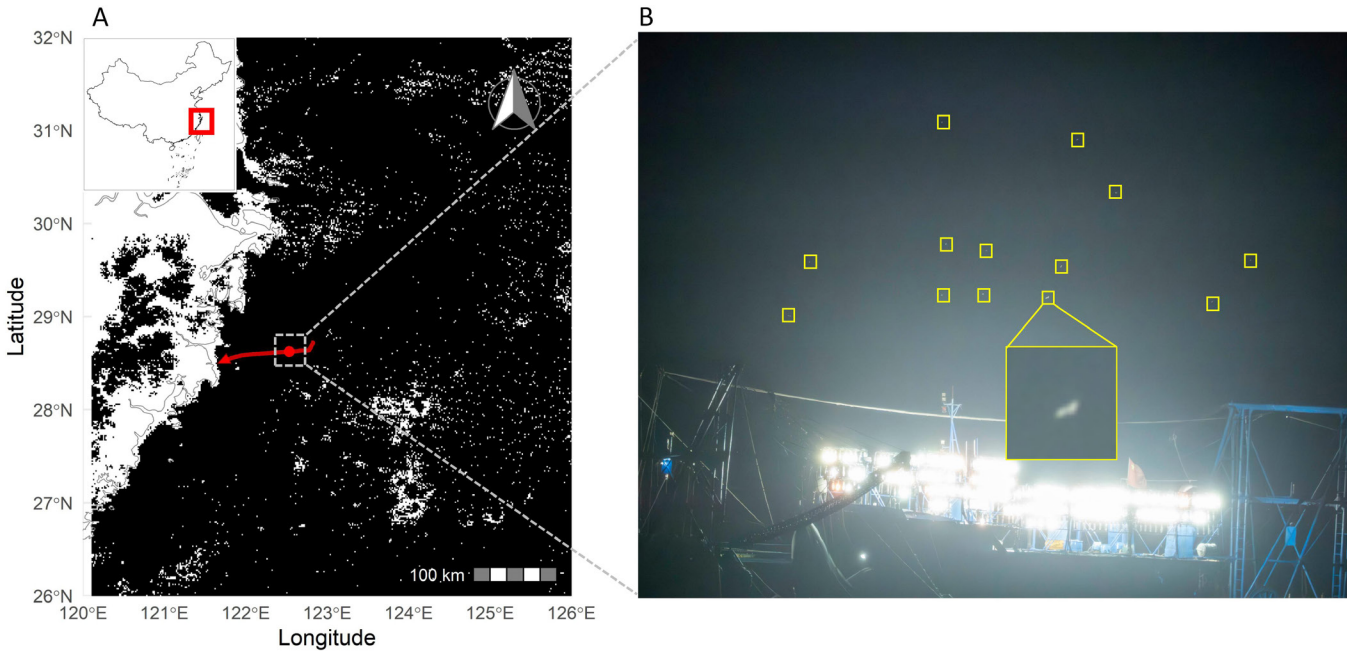


Fig. 1. Observation location and photograph of a light falling-net vessel with a trapped bird flock, operating on 14 October 2025 in the East China Sea (28.63°N, 122.53°E): (A) Trajectory and location of observed vessel (red arrow) with binarized nighttime light base map (data source: Black Marble nighttime lights from NASA, image from the same date; see Román et al., 2018); inset at top left shows the location relative to China (red box). (B) Birds circling inside the light column of the fishing vessel, with individual birds marked by yellow squares. Photo credit: Yu-Xin Lu

ACKNOWLEDGEMENTS

This work was supported by the National Key R&D Program of China (Key Special Project for Marine Environmental Security and Sustainable Development of Coral Reefs, Grant No. 2023-3.1), Scientific Research Foundation of the Third Institute of Oceanography, Ministry of Natural Resources (No. 2026044, No. 2026020). We thank the survey vessel's captain Lai Fu for his help. We also appreciate Yuanyuan Zhao, Lei Zhu, and reviewers for their constructive feedback that improved the manuscript.

AUTHOR CONTRIBUTIONS

Conceptualization: YCC, YXL. Field observation: YXL, BK, FXW. Funding acquisition: FXW. Visualization: YCC, YFG, YL. Writing—original draft: YCC. Writing—review & editing: all coauthors.

REFERENCES

Bai, M.-L., Huang, C.-H., & Lien, Y.-Y. (2025). Seasonal and spatial patterns of avian assemblages in the eastern Taiwan Strait: Implications for offshore wind farm development. *Marine Ornithology*, *53*(2), 383–392. https://doi.org/10.5038/2074-1235.53.2.1659

Cheng, Y.-C., Lu, Y.-X., Kang, B., Ge, Y.-F., Liu, Y., Wu, F.-X. (2026). *A column of light from an operating fishing vessel traps bird flocks* [Video]. Figshare. https://doi.org/10.6084/m9.figshare.32006238

Debski, I., & Holmes, M. (2017, September 23–28). *Seabird interactions with squid jig fisheries* [Plenary document SC5-Doc29]. 5th Meeting of the Scientific Committee of the South Pacific Regional Fisheries Management Organisation, Shanghai, China. https://www.sprfmo.int/assets/Meetings/02-SC/5th-SC-2017/Plenary-documents/SC5-Doc29-Squid-jig-bird-interactions_a.pdf

Gaston, K. J., & Sánchez de Miguel, A. (2022). Environmental impacts of artificial light at night. *Annual Review of Environment and Resources*, *47*, 373–398. https://doi.org/10.1146/annurev-environ-112420-014438

Li, J., Qiu, Y., Cai, Y., Zhang, K., Zhang, P., Jing, Z., Wu, Q., Ma, S., Liu, H., & Chen, Z. (2022). Trend in fishing activity in the open South China Sea estimated from remote sensing of the lights used at night by fishing vessels. *ICES Journal of Marine Science*, *79*(1), 230–241. https://doi.org/10.1093/icesjms/fsab260

Marangoni, L. F. B., Davies, T., Smyth, T., Rodríguez, A., Hamann, M., Duarte, C., Pendoley, K., Berge, J., Maggi, E., & Levy, O. (2022). Impacts of artificial light at night in marine ecosystems—A review. *Global Change Biology*, *28*(18), 5346–5367. https://doi.org/10.1111/gcb.16264

Montevecchi, W. A. (2006). Influences of artificial light on marine birds. In C. Rich & T. Longcore (Eds.), *Ecological consequences of artificial night lighting* (pp. 94–113). Island Press.

Rodríguez, A., Holmes, N. D., Ryan, P. G., Wilson, K.-J., Faulquier, L., Murillo, Y., Raine, A. F., Penniman, J. F., Neves, V., Rodríguez, B., Negro, J. J., Chiaradia, A., Dann, P., Anderson, T., Metzger, B., Shirai, M., Deppe, L., Wheeler, J., Hodum, P., . . . Le Corre, M. (2017). Seabird mortality induced by land-based artificial lights. *Conservation Biology*, *31*(5), 986–1001. https://doi.org/10.1111/cobi.12900

Román, M. O., Wang, Z., Sun, Q., Kalb, V., Miller, S. D., Molthan, A., Schultz, L., Bell, J., Stokes, E. C., Pandey, B., Seto, K. C., Hall, D., Oda, T., Wolfe, R. E., Lin, G., Golpayegani, N., Devadiga, S., Davidson, C., Sarkar, S., . . . Masuoka, E. J. (2018). NASA's Black Marble nighttime lights product suite. *Remote Sensing of Environment*, *210*, 113–143. https://doi.org/10.1016/j.rse.2018.03.017

Van Doren, B. M., Horton, K. G., Dokter, A. M., Klinck, H., Elbin, S. B., & Farnsworth, A. (2017). High-intensity urban light installation dramatically alters nocturnal bird migration. *Proceedings of the National Academy of Sciences*, *114*(42), 11175–11180. https://doi.org/10.1073/pnas.1708574114

Zhang, S., Zhang, P., Wang, T., Li, J., Brown, C. L., & Li, M. (2025). Illuminating the conservation darkness: Unveiling the neglected interactions between odontocetes and the light falling-net fishery in the South China Sea. *Water Biology and Security*, *5*(1), Article 100424. https://doi.org/10.1016/j.watbs.2025.100424