Agreement on the Conservation of Albatrosses and Petrels

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Improving compliance with bird scaring line measures in longline and trawl fisheries

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SUMMARY

Bird-scaring lines (BSL) are a best practice mitigation measure for the mitigation of seabird interactions and bycatch in pelagic longline, demersal longline and trawl fisheries. While BSL have proven to successfully reduce seabird deaths and bait loss in fisheries, compliance with their use remains a challenge. The use of electronic monitoring devices may help ensure implementation and compliance with BSL mitigation measures while vessels are out at sea. A BSL compliance monitoring device has been developed and trialled with funding provided as an ACAP Small Grant awarded in 2020. The device works by continuously measuring the tension exerted by a BSL when its terminal end is dragged through the water. Such devices have the potential for improving the independent monitoring of the deployment and use of BSLs, and to reduce workloads and potential work health and safety hazards facing fisheries observers at sea. Further research and development of BSL compliance monitoring devices is merited.

RECOMMENDATIONS

That the Seabird Bycatch Working Group:

1. Recognises the need to develop technologies and techniques for improving compliance with birds scaring line (BSL) measures in longline and trawl fisheries.
2. Recognises the potential of the BSL compliance monitoring device as a means of improving the independent monitoring of the deployment and use of bird scaring lines, to reduce workloads and potential work health and safety hazards of fisheries observers.
3. Encourages research on technologies including the BSL compliance monitoring device to improve compliance with bird scaring line measures in longline and trawl fisheries.

Mejora del cumplimiento de las medidas relativas a líneas espantapájaros en las pesquerías de palangre y de arrastre

RESUMEN

Las líneas espantapájaros (LEP) son una medida de mejores prácticas para mitigar las interacciones con las aves marinas y la captura secundaria en las pesquerías de palangre pelágico o demersal y de arrastre. Aunque se ha demostrado que las LEP reducen con éxito la muerte de las aves marinas y la pérdida de cebo en las pesquerías, el cumplimiento de su uso sigue constituyendo un desafío. El uso de dispositivos de monitoreo electrónico puede ayudar a garantizar la implementación y el cumplimiento de las medidas de mitigación que incluyen LEP mientras los buques están en el mar. Se ha desarrollado y probado un dispositivo de monitoreo del cumplimiento del uso de LEP con financiación proporcionada como pequeña subvención del ACAP concedida en 2020. El dispositivo mide continuamente la tensión ejercida por una LEP cuando su extremo terminal se arrastra por el agua. Estos dispositivos pueden mejorar el monitoreo independiente de la implementación y el uso de LEP, así como reducir la carga de trabajo y los posibles riesgos para la salud y la seguridad laboral de los observadores de pesquerías en el mar. Cabe seguir investigando y desarrollando dispositivos de monitoreo del cumplimiento de uso de LEP.

RECOMENDACIONES

Que el Grupo de Trabajo sobre Captura Secundaria de Aves Marinas tome las siguientes medidas:

1. Reconocer la necesidad de desarrollar tecnologías y técnicas para mejorar el cumplimiento de las medidas relativas a líneas espantapájaros (LEP) en pesquerías de palangre y de arrastre.
2. Reconocer el potencial del dispositivo de monitoreo de cumplimiento de uso de LEP como medio para mejorar el monitoreo independiente de la implementación y la utilización de líneas espantapájaros, para reducir la carga de trabajo y los posibles riesgos para la salud y la seguridad laboral de los observadores de las pesquerías.
3. Fomentar la investigación sobre tecnologías, incluido el dispositivo de monitoreo del cumplimiento de uso de LEP, para mejorar el cumplimiento de las medidas relativas a líneas espantapájaros en las pesquerías de palangre y de arrastre.

Amélioration du respect des mesures relatives aux dispositifs d'effarouchement des oiseaux dans les pêcheries à la palangre et au chalut

RÉSUMÉ

Les dispositifs d'effarouchement des oiseaux comptent parmi les bonnes pratiques d'atténuation des interactions avec les oiseaux de mer et des captures accessoires dans les pêcheries à la palangre pélagique, les pêcheries à la palangre démersale et les pêcheries au chalut. Bien que ces dispositifs se soient avérés efficaces pour réduire la mortalité des oiseaux de mer et les pertes d'appâts dans les pêcheries, l'application de ces bonnes pratiques reste difficile à garantir. Des dispositifs de suivi électronique peuvent contribuer à assurer la mise en œuvre et le respect des mesures d'atténuation à l'aide de dispositifs d'effarouchement des oiseaux lorsque les navires sont en mer. Un système de contrôle de l'utilisation des dispositifs d'effarouchement des oiseaux a été mis au point et testé grâce à un financement accordé en 2020 dans le cadre des Petites subventions de l'ACAP. L'appareil fonctionne en mesurant en continu la tension d'un dispositif d'effarouchement des oiseaux lorsque son extrémité est traînée dans l'eau. Les systèmes de ce type pourraient améliorer le suivi indépendant du déploiement et de l'utilisation des dispositifs d'effarouchement des oiseaux, et réduire la charge de travail et les risques pour la santé et la sécurité des observateurs en mer. La recherche et le développement sur les dispositifs de suivi de l'utilisation des dispositifs d'effarouchement des oiseaux méritent d'être poursuivis.

RECOMMANDATIONS

Que le groupe de travail sur les captures accessoires :

1. Reconnaisse la nécessité de mettre au point des technologies et des techniques permettant d'améliorer le respect des mesures relatives aux dispositifs d'effarouchement des oiseaux dans les pêcheries à la palangre et au chalut.
2. Reconnaisse le potentiel du système de contrôle de l'utilisation des dispositifs d'effarouchement des oiseaux pour améliorer le suivi indépendant du déploiement et de l'utilisation de ces dispositifs, et pour réduire la charge de travail et les risques pour la santé et la sécurité des observateurs en mer.
3. Encourage la recherche technologique, notamment sur le dispositif de contrôle de l'utilisation, afin d'améliorer le respect des mesures relatives aux dispositifs d'effarouchement des oiseaux dans les pêcheries à la palangre et au chalut.

1. INTRODUCTION

Bird-scaring lines (BSL) are a best practice mitigation measure for the mitigation of seabird interactions and bycatch in pelagic longline, demersal longline and trawl fisheries (ACAP 2021a, 2021b, 2021c).

While BSL have been in use as a seabird bycatch mitigation measure since the early 1990s and proven to successfully reduce seabird deaths and bait loss in fisheries (Brothers 1991), compliance with their use, however, remains a challenge (Phillips et al., 2016). Monitoring of the deployment and effective use of BSL has been undertaken as part of fisheries observer programs, and more recently through auditing of video imagery captured by electronic monitoring systems in some fisheries.

Conservation and Management Measures developed by Regional Fisheries Management Organisations provide fishing operators with the option of choosing which seabird bycatch mitigation technology or technique will be employed from a suite of mitigation measures including BSL. This may result in BSL use during daytime and/or at night. BSL use occurs during setting of longlines and trawling in all weather and sea state conditions.

Visual observations and capture of video footage of BSL may be problematic in a range of settings, e.g. sunrise/sunset and at night, during fog, and during storms. Conditions at sea may also pose work health and safety issues for fisheries observers when attempting to observe the deployment and use of BSL at the stern of the longliner/trawler.

The use of electronic monitoring devices may help ensure implementation and compliance with mitigation measures while vessels are out at sea (Diaz et al., 2019, van Helmond et al., 2020). This includes development of BSL compliance monitoring devices (Angel et al. 2021 SBWG10 Inf 18).

2. DEVELOPMENT OF A BSL COMPLIANCE MONITORING DEVICE

Angel et al. (2021) (SBWG10 Inf 18) reported on progress with the development of a pilot-BSL compliance monitoring device. An ACAP Small Grant was awarded in 2020 to Birdlife South Africa (BLSA), in partnership with Imvelo Blue Environment Consultancy (Imvelo) for a project to further the development of a pilot-BSL compliance monitoring device. The device uses mechatronic engineering, i.e. integration of mechanical, electronic and electrical signals to convert the mechanical tension, measured in kilogram units (kg), of a deployed BSL into an electronic output in the form of tension data points, each associated to a specific date and time.

The BSL compliance monitoring device works by continuously measuring the tension (kg) exerted by a BSL when its terminal end is dragged through the water. The BSL is attached to the tension sensing element of the device which records the tensile force being exerted onto it by the BSL. The tensile force is thus detected by the computing unit within the device and at set recording intervals. This information is converted into data points associated with the date and time the tensile force was exerted onto the BSL. Each prototype of the device consists of: a securing mechanism that attaches directly to a BSL; an internal storage component that communicates with the computing unit, configured to record tension data; an independently rechargeable battery system; and a waterproof casing manufactured from rigid material (**Figure 1**).

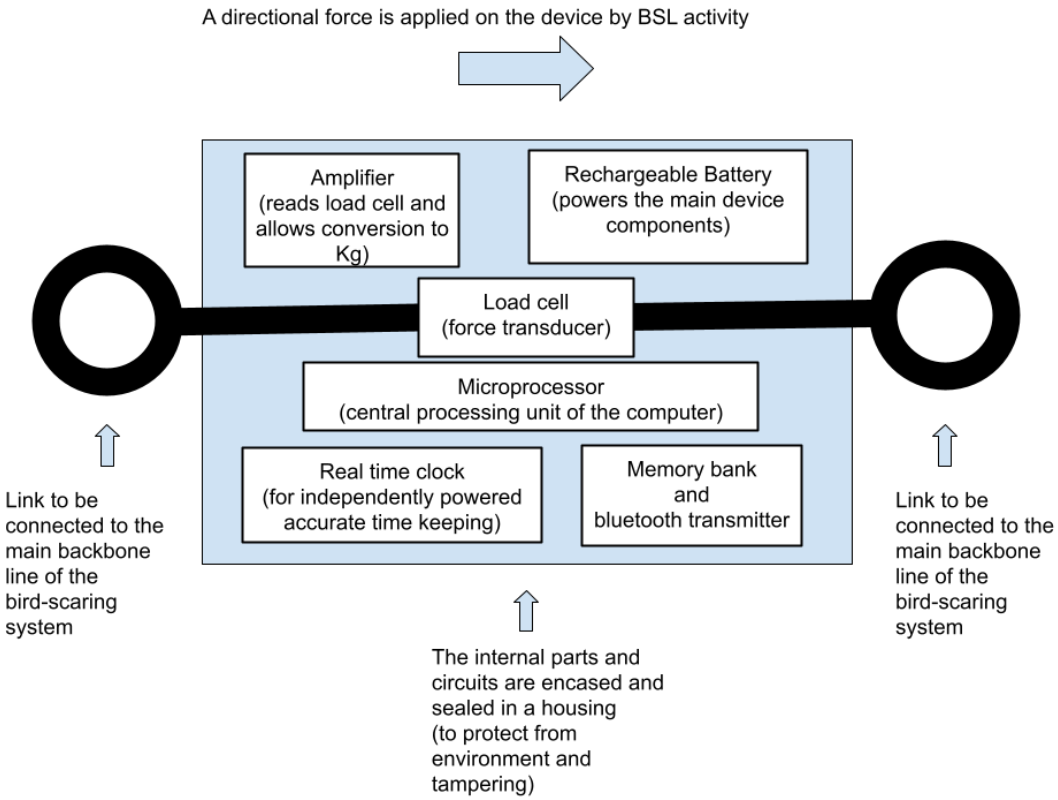

Figure 1. Diagram showing the components of BSL compliance monitoring device prototype.

The data were sampled and stored by the device's internal mechanisms at set intervals and converted to data points associated with the date and time of capture. Each device was set to trigger the collection of data when a tension equal to or exceeding 4 kg was exerted by the BSL for more than 4 min, defined as the start of a 'Measured Event'. A 'Measured Event' could last for several hours and ended when the tension dropped below 4 kg for more than 4 min. Each 'Measured Event' was expressed as 'Tension Profiles' as the product of the tension in kg produced by the pull of the BSL over time (**Figure 2**).

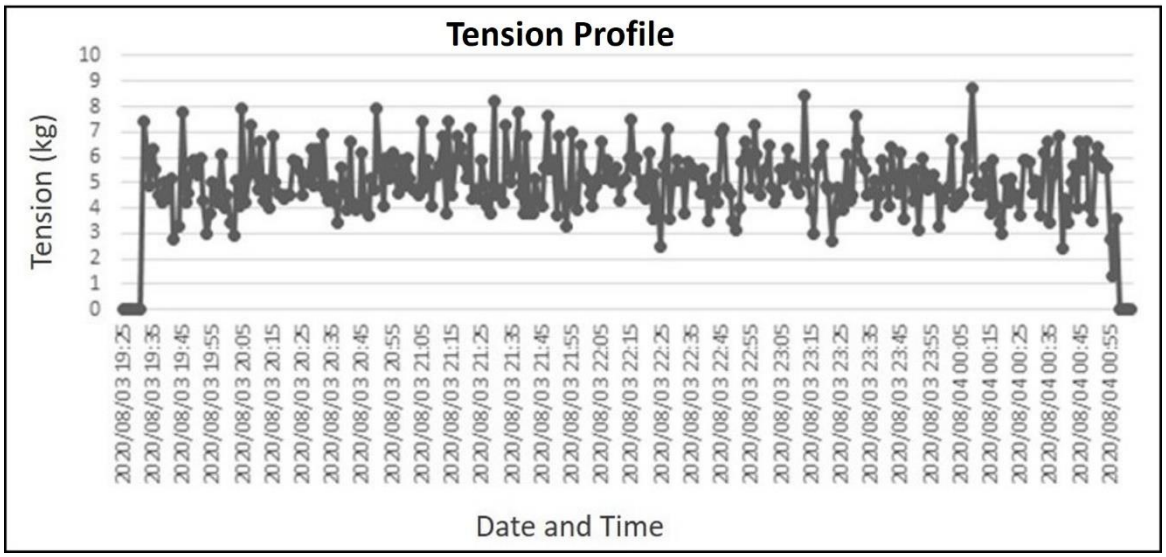

Figure 2. Graph of a 'Measured Event' of more than five hours of data outputs, expressed as a 'Tension Profile', showing the fluctuations in tension, produced by the pull of the BSL while deployed.

Full details of the trials of the prototype BSL compliance monitoring device are provided in Angel et al. (2021) (SBWG10 Inf 18). The trials comprised a total of 10 sea trips, with 10 participating vessels representing 3 different fleets; trawl, pelagic longline and demersal longline, took part in the trials. Each vessel carried an 'Active' device attached to a BSL when leaving harbour. A total of 5 device prototypes were tested and improved upon. The devices were designed to be able to be reattached if they became detached due to a high-tension event or entanglements, so that data collection could continue. The trials have led to improved designs of the device to withstand the tougher conditions and heavier BSLs used by trawl vessels. This included improving the device attachment points, including a mechanical weak link which protects the device in case of high-tension events and line entanglement. Once retrieved each device was inspected for external damage and potential tampering. The casing was opened, and data were downloaded for analyses from the device's the memory bank. Further improvements of the device now allow for data to be transferred using wireless technologies.

3. NEXT STEPS

The BSL compliance monitoring device (Angel et al. 2021, SBWG10 Inf 18) represents the first technology or technique that would allow independent confirmation that a fishing vessel at sea is complying with its obligations to deploy and use BSL. The technology has direct application in domestic and high seas pelagic longline, demersal longline and trawl fisheries, including to confirm that fishing vessels are complying with mandatory BSL requirements under Conservation and Management Measures developed by RFMOs. Data recorded and collected from such devices also allow for confirmation of fishing vessel logbook entries about the use of BSL.

The work undertaken so far in developing a BSL compliance monitoring device demonstrates the utility of the device to independently verify the deployment and use of BSL during fishing operations. Consideration has been given to the conditions the device would ordinarily operate under, including high-tension events and line entanglement. The technology also has the potential to reduce workloads and potential work health and safety hazards of fisheries observers.

Further research and development of BSL compliance monitoring devices is merited. Further research would help to reduce the size, improve the wireless connectivity, prevent damage, and to tamper-proof the device, and allow the device to move from a prototype design to one suitable for manufacture.

2. REFERENCES

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