 <p>Agreement on the Conservation of Albatrosses and Petrels</p>	<p>Fifth Meeting of the Seabird Bycatch Working Group <i>La Rochelle, France, 1-3 May 2013</i></p> <p>Electronic Monitoring of Seabird Bycatch</p> <p><i>Warren Papworth, Secretariat</i></p>
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SUMMARY

Electronic monitoring is the use of fixed cameras on fishing vessels to record data on fishing activity. Digital images from the cameras are stored on a computer hard drive on the vessels and later analysed. It can be used to complement other systems for data collection, such as the use of log books or onboard observers. It is particularly suited for collecting data on rare events, such as seabird bycatch, where 100% observer coverage may be necessary statistically, but is not possible due to the relatively higher cost of providing onboard observers.

The current level of observer coverage in most tuna regional fisheries management organisations (tRFMOs) is only 5% (SBWG5 Doc 23). The quality of the data collected and/or reported is insufficient to meet ACAP's main objectives for collecting seabird bycatch data, which are 1. to characterise and quantify seabird bycatch within a fishery, 2. to understand the nature of seabird bycatch, and 3. to assess the effectiveness of seabird bycatch measures in reducing mortality (AC6 Report, para 15.9.1).

The installation of e-monitoring equipment on fishing vessels could provide information on seabird bycatch events, identify whether bycatch mitigation measures are being used effectively, as well as collecting information on seabird assemblages surrounding the vessel.

RECOMMENDATIONS

It is proposed that ACAP:

1. actively promote the use of e-monitoring in both high seas and domestic fisheries where there is an overlap of seabird distribution with fishing effort;
2. undertake a study to identify the most effective deployment of cameras for capturing seabird bycatch events;
3. support research to automate the identification of seabird bycatch events;
and
4. develop protocols for the analysis of e-monitoring data relating to seabird bycatch.

Monitoreo electrónico de la captura secundaria de aves marinas

El monitoreo electrónico consiste en el uso de cámaras fijas en los buques pesqueros para registrar datos de la actividad pesquera. Las imágenes digitales de las cámaras se almacenan en el disco rígido de los buques y se analizan posteriormente. Se puede usar para complementar otros sistemas para la recolección de datos, como el uso de registros u observadores a bordo. Es especialmente adecuado para recopilar datos sobre eventos poco frecuentes, como la captura secundaria de aves marinas, donde si bien puede ser necesario en términos estadísticos el 100% de cobertura por parte de observadores, esto no es posible debido al costo relativamente más alto de proporcionar observadores a bordo.

El nivel actual de cobertura por parte de observadores en la mayoría de las organizaciones regionales de ordenamiento pesquero (OROP) de atún es de tan solo el 5% (GdTCS5 Doc 23). La calidad de los datos recopilados y/o informados no es suficiente para cumplir con los objetivos principales del ACAP para recolectar datos de captura secundaria de aves marinas, a saber, 1. caracterizar y cuantificar la captura secundaria de aves marina en una pesquería, 2. comprender las características de la captura secundaria de aves marinas, y 3. evaluar la efectividad de las medidas para evitar la captura secundaria de aves marinas en la reducción de la mortalidad (Informe CA6, párrafo 15.9.1).

La instalación de equipos de monitoreo electrónico en los buques pesqueros podría proporcionar información sobre los eventos de captura secundaria de aves marinas, identificar si las medidas de mitigación de la captura secundaria de aves marinas se usan de manera efectiva, así como recopilar información sobre los grupos de aves marinas que rodean el buque.

RECOMENDACIONES

Se propone que el ACAP:

1. promueva de manera activa el uso de monitoreo electrónico tanto en las pesquerías de altamar como en las locales, donde se observe una superposición de la distribución de aves marinas con el esfuerzo pesquero;
2. realice un estudio para identificar el despliegue más efectivo de cámaras para captar eventos de captura secundaria de aves marinas;
3. apoye las investigaciones para automatizar la identificación de eventos de captura secundaria de aves marinas; y
4. desarrolle protocolos para el análisis de datos de monitoreo electrónico relacionados con la captura secundaria de aves marinas.

Surveillance électronique des captures accidentelles d'oiseaux marins

Dans le cadre de la surveillance électronique, des caméras sont fixées sur les bateaux de pêche pour enregistrer les activités de pêche. Les images numériques enregistrées par les caméras sont stockées sur un disque dur situé sur les bateaux et sont, ensuite, analysées. Ces caméras peuvent être utilisées en complément d'autres systèmes de collecte de données, tels que des journaux de bord ou des observateurs à bord. Elles sont particulièrement adaptées à la collecte de données liées à des événements rares, comme les captures accidentelles d'oiseaux marins. D'un point de vue statistique, il peut être nécessaire que ces événements soient couverts à 100% par des observateurs, mais les coûts relativement élevés inhérents à la présence d'observateurs à bord constituent un frein à cette pratique.

Dans la plupart des ORGP thonières (Organisations régionales de la Gestion des Pêches), seuls 5% de ces événements sont actuellement couverts par des observateurs (GTCA5 Doc 23). Le faible niveau de qualité des données collectées et/ou rapportées ne permet pas d'atteindre les objectifs fixés par l'ACAP en matière de collecte de données liées aux captures accidentelles d'oiseaux marins. Ces objectifs sont 1. caractériser et quantifier les captures accidentelles d'oiseaux marins au sein d'une pêcherie, 2. comprendre la nature des captures accidentelles d'oiseaux marins, et 3. évaluer l'efficacité des mesures d'atténuation des captures accidentelles d'oiseaux marins destinées à réduire leur mortalité (Rapport CC6, para. 15.9.1).

L'installation d'équipements de surveillance électronique sur les bateaux de pêche pourrait fournir des informations en matière de captures accidentelles d'oiseaux marins ; ces instruments permettraient d'évaluer l'efficacité des mesures d'atténuation des captures accidentelles et de collecter des informations sur les rassemblements d'oiseaux marins à proximité des bateaux.

RECOMMANDATIONS

Il est recommandé que l'ACAP :

1. promeuve activement l'utilisation de systèmes de surveillance électronique dans les pêcheries en haute mer et dans les pêcheries nationales dans les zones qui concentrent chevauchement de l'aire de répartition des oiseaux marins et un effort de pêche significatif ;
2. mène une étude pour optimiser le déploiement des caméras destinées à enregistrer des captures accidentelles d'oiseaux marins ;
3. soutienne la recherche pour automatiser l'identification des captures accidentelles d'oiseaux marins ; et
4. développe des protocoles pour l'analyse des données liées aux captures accidentelles d'oiseaux marins, enregistrées grâce aux systèmes de surveillance électronique.

1. BACKGROUND

At the Sixth Meeting of the Advisory Committee (AC6) it was noted that the main objectives of collecting seabird bycatch data are to characterise and quantify seabird bycatch within a fishery, to understand the nature of seabird bycatch, and to assess the effectiveness of seabird bycatch measures in reducing mortality (AC6 Report, para 15.9.1). It has been noted that to adequately characterize rare events (such as seabird bycatch), up to 100% observer coverage may be required statistically (WCPFC-SC2 Report, para 32). A review of tRFMO scientific observer programmes has revealed that most only have a requirement for 5% coverage of longline effort, and that a number of the tRFMOs do not currently collect critical data that is considered necessary by ACAP to characterise seabird bycatch (SBWG5 Doc 23).

The implementation of electronic monitoring programmes is proposed as a mechanism for improving the collection of this data. An electronic monitoring system consists of a number of cameras that are fixed to a fishing vessel in appropriate places to review fishing operations. The data collected from these cameras is stored on a hard disk on the fishing vessel for later analysis. The cameras are linked to sensors that monitor the activity of fishing equipment, which allows the cameras to be turned on and off in association with key events, such as setting and hauling (Fig. 1).

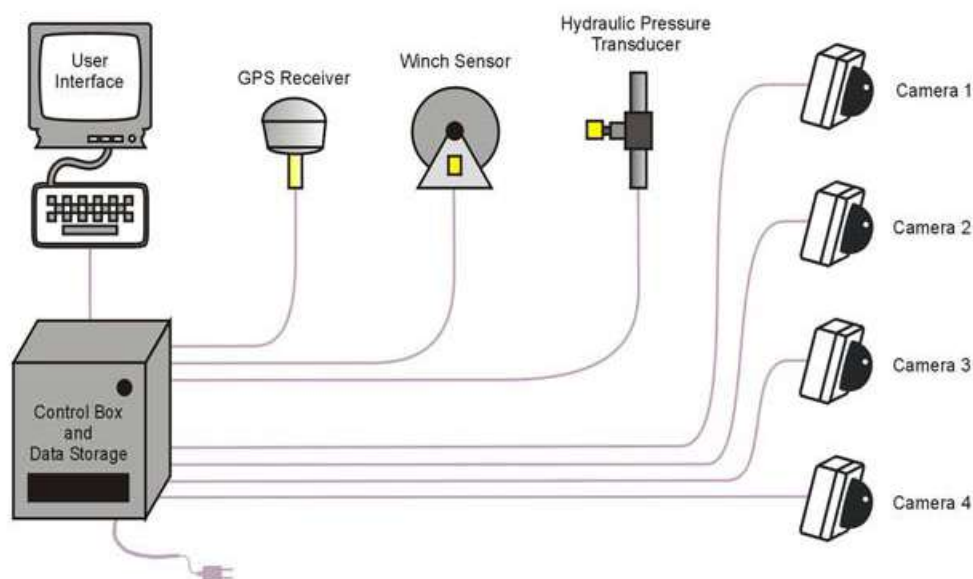


Fig.1 From 'E-monitoring', Australian Fisheries Management Authority, 30 September 2011

<http://www.afma.gov.au/managing-our-fisheries/data-collection/e-monitoring/#pubs>

E-monitoring systems complement other data collection systems, such as onboard observers and log books. They have been trialled in a number of countries, including Australia, Canada, Sweden and the USA and now form a well established component of some national observer programmes. Reports of some of the trials can be read here:

<http://www.afma.gov.au/managing-our-fisheries/data-collection/e-monitoring/>

<http://www.afma.gov.au/wp-content/uploads/2011/06/ETBF2.pdf>

http://www.ascobans.org/pdf/ac16/AC16_53_EMStudySmallerBoats.pdf

It could be argued that one of the main reasons for CCAMLR's success in reducing the incidental bycatch of seabirds in its fisheries has been its requirement for 100% observer coverage. It is unlikely that the tRFMOs will achieve 100% observer coverage of their longline fisheries in the foreseeable future, consequently alternative mechanisms for collecting the critical data identified by ACAP must be considered.

2. KEY ISSUES

There are a number of considerations that need to be taken into account when considering the introduction of e-monitoring systems. A brief discussion of these issues follows.

2.1. Identification of Bycatch Events

The use of e-monitoring to monitor bycatch hauled onboard the fishing vessel has the potential to be very effective in identifying bycatch events, as it is operating 100% of the time lines are being set/hailed. However, the usefulness of the data depends on how much of the digital imagery is analysed. Some management systems only require 10% of the footage to be audited.

It will not capture bycatch events if the branchline is cut by a crew member before the seabird is hauled onboard.

It is unlikely that an image from an e-monitoring system will be adequate to identify the species of the seabird. Further development of recognition software may be able to increase the level of species identification in the future.

2.2. Monitoring Effectiveness of Mitigation Being Used

The use of e-monitoring systems can be of great benefit in analysing the effectiveness of the bycatch mitigation measures being used. This is particularly the case for the three mitigation measure recommended by ACAP for use in pelagic longline fisheries; tori lines, night-setting and weighting of branch-lines. Cameras will need to be located in appropriate positions to view the mitigation measures when they are in use.

2.3. Identification of Seabird Assemblages

The use of e-monitoring has the potential to add value by collecting large volumes of data in a format that is useful for scientific analysis. This technology could be particularly useful for collecting data on seabird assemblages surrounding fishing vessels. Although this data is sought by some scientific observer programmes, the data collected by observers has the potential for significant bias, depending on the sampling protocol adopted. Data collected through an e-monitoring system can be systematically collected in accordance with agreed criteria and the scientist analysing the data can then define the sampling protocol to be applied.

2.4. Potential Synergies

The use of e-monitoring also has potential benefits for other types of bycatch, such as sharks and turtles, the effective management of which is also affected by a lack of data. This provides significant potential for collaboration with organisations that are concerned with the

bycatch of these species. Such collaboration could extend to jointly funding e-monitoring trials.

The Secretariat is aware of two e-monitoring studies currently being developed with tRFMO fisheries. The first is a GEF funded project titled, 'Sustainable Management of Tuna Fisheries and Biodiversity Conservation in the Areas Beyond National Jurisdiction (ABNJ)'. The objective of the Electronic Observer Systems subcomponent of this project is to 'deploy Electronic Monitoring (EM) systems on long line fishing vessels based in Fiji to collect positional, fishing activity, and catch related data'. The second is a project proposed by the International Seafood Sustainability Foundation (ISSF), which seeks to evaluate the benefits of e-monitoring on pelagic long-line vessels fishing for tuna species.

REFERENCES

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