

 <p data-bbox="215 533 454 571">Agreement on the Conservation of Albatrosses and Petrels</p>	<p data-bbox="491 241 1406 280"><b>Sixth Meeting of the Seabird Bycatch Working Group</b></p> <p data-bbox="630 297 1406 336"><i>Punta del Este, Uruguay, 10 - 12 September 2014</i></p> <p data-bbox="715 414 1177 452"><b>E-monitoring Fact-sheet</b></p> <p data-bbox="662 477 1230 515"><b><i>Anthony Tisot<sup>1</sup>, Warren Papworth<sup>2</sup></i></b></p> <p data-bbox="625 537 1270 575"><b><i><sup>1</sup> Archipelago Marine Research, <sup>2</sup> ACAP Secretariat</i></b></p>
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### **SUMMARY**

Accurate, unbiased reporting is critical to evaluating the effectiveness of bycatch mitigation measures. Increasingly, both industry and managers of commercial fisheries have turned to CCTV-based electronic monitoring (EM) as a cost-effective alternative to at-sea observers. While automatically monitoring fishing activity, EM systems can also help review protected species interactions and evaluate the effectiveness of bycatch mitigation efforts. An electronic monitoring program uses a system of video cameras, gear sensors, and GPS mapping technology to create a clear and accurate profile of a vessel's fishing activity at sea. It is commonly used on commercial fishing vessels operating a variety of fishing gear.

Electronic monitoring is an effective tool for monitoring the effective use of many of the mitigation measures that have been recommended by ACAP to reduce the incidental mortality of seabirds in demersal and pelagic long-line and trawl fisheries.

As an affordable, non-intrusive monitoring tool, electronic monitoring offers a versatile alternative for fisheries and industry regulators to help verify self-reported data and promote responsible fisheries management at sea.

### **RECOMMENDATIONS**

The Seabird Bycatch Working Group is requested to:

1. Review the proposed fact-sheet on electronic monitoring; and
2. Endorse its publication as a bycatch mitigation fact-sheet.

### **Hoja informativa sobre monitoreo electrónico**

La elaboración de informes precisos e imparciales es esencial a la hora de evaluar la efectividad de las medidas de mitigación de captura secundaria. Tanto el sector pesquero como los administradores de pesquerías comerciales recurren cada vez más al monitoreo electrónico mediante circuitos cerrados de televisión (CCTV) como alternativa rentable a la presencia de observadores a bordo. Estos sistemas de monitoreo electrónico no solo controlan automáticamente la actividad pesquera, sino que también ayudan a estudiar las interacciones de las especies protegidas y evaluar la efectividad de los esfuerzos en materia de mitigación de captura secundaria. El programa de monitoreo electrónico utiliza un sistema de videocámaras, sensores en los artes de pesca y tecnología de mapeo por GPS para crear un perfil claro y preciso de la actividad pesquera en el mar de un buque determinado. Se lo suele emplear en buques de pesca comercial que usan diversos artes de pesca.

El monitoreo electrónico es una herramienta efectiva a la hora de controlar el uso eficaz de muchas de las medidas de mitigación que recomienda el ACAP para disminuir la mortalidad incidental de aves marinas en pesquerías de arrastre y palangre demersal y pelágico.

Como herramienta de monitoreo asequible y no invasiva, este sistema ofrece una alternativa versátil para pesquerías y entidades reguladoras del sector que los ayuda a verificar los datos que informan y fomenta una ordenación responsable de las pesquerías en el mar.

### **RECOMENDACIONES**

Se solicita al Grupo de Trabajo sobre Captura Secundaria que tenga a bien:

1. poner bajo su consideración la hoja informativa propuesta sobre monitoreo electrónico; y
2. aprobar su publicación como hoja informativa sobre mitigación de la captura secundaria.

### **Fiche d'information sur la surveillance électronique**

Un compte-rendu précis et impartial est indispensable pour évaluer l'efficacité des mesures d'atténuation des captures accessoires. De plus en plus, l'industrie comme les responsables des pêcheries commerciales se tournent vers la surveillance électronique par TVCC, comme alternative rentable aux observateurs en mer. Tout en surveillant automatiquement l'activité de pêche, les systèmes de surveillance électronique aident à étudier les interactions avec les espèces protégées et à évaluer l'efficacité des efforts d'atténuation des captures accessoires. Un programme de surveillance électronique s'appuie sur un système de caméra vidéo, des détecteurs d'engins et une technologie de cartographie GPS pour créer une fiche profile claire et précise des activités de pêche en mer d'un navire. Ce programme est fréquemment utilisé sur les navires de pêche commerciale utilisant divers engins de pêche.

La surveillance électronique est un outil efficace pour contrôler l'utilisation effective de plusieurs mesures d'atténuation recommandées par l'ACAP dans le but de réduire le taux de mortalité accidentelle des oiseaux marins dans les pêcheries chalutières et palangrières démersales et pélagiques.

En tant qu'outil de surveillance abordable et non intrusif, la surveillance électronique offre une alternative polyvalente pour les organismes de régulation de l'industrie et des pêcheries. Il permet en outre d'aider à vérifier les données auto-déclarées et de promouvoir la gestion responsable des pêcheries en mer.

### **RECOMMANDATIONS**

Le Groupe de travail sur les captures accessoires d'oiseaux marins est appelé à :

1. vérifier la fiche d'information proposée sur la surveillance électronique ; et
2. promouvoir sa publication en tant que fiche d'information sur les mesures d'atténuation des captures accessoires.

## E-MONITORING FACT-SHEET

### Practical information on seabird bycatch mitigation measures

#### Electronic Monitoring: CCTV-based reviewing and reporting

**Accurate, unbiased reporting is critical to evaluating the effectiveness of bycatch mitigation measures. Increasingly, both industry and managers of commercial fisheries have turned to CCTV-based electronic monitoring (EM) as a cost-effective alternative to at-sea observers. While automatically monitoring fishing activity, EM systems can also help review protected species interactions and evaluate bycatch mitigation efforts.**

##### **What is Electronic Monitoring (EM)?**

An electronic monitoring program uses a system of video cameras, gear sensors, and GPS mapping technology to create a clear and accurate profile of a vessel's fishing activity at sea.

The equipment runs automatically, mapping the cruise track, logging fishing times and locations, monitoring winches, pumps and lifts, and creating a video record of all key fishing operations, including the mitigation measures and procedures necessary to reduce incidents of seabird bycatch.



##### **How does EM work?**

All sensors, cameras and GPS are managed by a control centre; when the control centre detects fishing activity, it creates a time-stamped record of all equipment activity (e.g. sets and hauls) at that location, and records video of key processes (e.g. hauling, sorting, discards, and processing). A visual record of any bycatch or protected species interactions can be saved for later review as well. This data can then be retrieved from the vessel and reviewed in the office to help better understand any events or challenges during the trip. Specialized software such as the EM Interpret™ data analysis tool developed by Archipelago Marine Research helps reviewers efficiently navigate weeks of data to quickly spot the information they need.

##### **What does EM cost?**

When evaluating the cost of an EM system, it's important to consider the entire program, not just the hardware and software. Total costs—including the system itself, maintenance, reviewing and reporting—typically amount to only a fraction of a comparable observer based service. Thanks to an increasing global demand for sustainable, fully documented fishing practices, some fleets may already have EM equipment in place that can then be used to monitor mitigation efforts in addition to primary fishing activities.

##### **What vessels can use EM?**

Electronic monitoring is commonly used on a variety of commercial fishing vessels and gear types, ranging from hook and line/trap vessels, to purse-seine factory ships, pelagic trawlers, and pelagic and demersal longliners. System size can easily be modified by adding cameras,

from a smaller single-camera system, to a standard four-camera setup, or a more comprehensive eight-camera system. All video feeds can be monitored in real-time by wheelhouse crew to help keep an eye on fishing activity and events on deck.

### **What types of events and activities can be monitored?**

An EM-equipped fishing vessel automatically creates a record of all key fishing operations including times, places, and fishing activities. This can include catch (quantity, condition, and species composition), fishing effort, gear usage, and of course, protected-species interactions and preventative measures. For example, on a longline vessel, one or more rear-facing cameras can be positioned to monitor seabird activity around demersal streamer lines. Or a close up camera can be added to monitor line-weighting procedures, while GPS and timestamps automatically verify the time and location for each activity. With appropriate cameras, it may also help to gather spatial and temporal information on seabird assemblages.



### **What are the minimum requirements?**

An EM system installs quickly, receiving power through a single AC or DC connection. Modern monitoring systems are designed to accommodate a range of power outputs, and include uninterruptable power supplies (UPS) to help “ride out” the power interruptions and outages that may occur on fishing vessels.

### **What are the benefits to agency/industry/others?**

As an affordable, non-intrusive monitoring tool, electronic monitoring offers a versatile alternative for fisheries and industry regulators to help verify self-reported data and promote responsible fisheries management at sea. In support of bycatch mitigation efforts, EM can help assess the effectiveness of each measure, highlight relative limitations and strengths, and support recommendations for best practices and wide-scale implementation.

**What seabird mitigation measures can be monitored with EM?**

Electronic monitoring can help in evaluating the proper use and effectiveness of a range of seabird mitigation measures:

- Demersal and pelagic longline:
  - streamer lines
  - line weighting
  - night-setting
  - discharge of offal
  - haul mitigation
- Demersal longline: underwater setting chute
- Pelagic longline: side-setting
- Blue-dyed bait
- Trawl fisheries:
  - warp strikes
  - net entanglements

**Acknowledgements**

Photos courtesy of Archipelago Marine Research [www.archipelago.ca](http://www.archipelago.ca)

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