



**SCIENTIFIC COMMITTEE
NINETEENTH REGULAR SESSION**

Koror, Palau
16-24 August 2023

BYCATCH MANAGEMENT INFORMATION SYSTEM (BMIS) UPDATE

WCPFC-SC19-2023/EB-IP-05

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INTRODUCTION

The WCPFC Bycatch Management Information System (BMIS) is an online resource aimed at fisheries managers and scientists, fishers, educators and the general public (see Figure 1). The database presents scientific and technical information on the mitigation and management of bycatch in pelagic tuna and billfish fisheries worldwide. Bycatch here refers to highly migratory species of special interest, including seabirds, sharks and rays, marine turtles and marine mammals (principally cetaceans).

The BMIS project was initiated in 2010 by WCPFC. Funding from the FAO Common Oceans Project in 2015-16 enabled a major redevelopment of the website and database, culminating in a site relaunch in 2017. This paper provides an update on BMIS curation, usage, and upgrades to site functionality, as well as projects underway. Historical development is documented in Fitzsimmons et al. (2015, 2017, 2018 and 2019), Williams et al. (2016 and 2017) and Williams (2018).

BMIS BYCATCH MANAGEMENT INFORMATION SYSTEM

HOME ABOUT BMIS RFMOs SPECIES GEAR RESOURCES

Errors? Omissions? Development ideas? Contact Us

REFERENCES REGULATIONS MANAGEMENT MITIGATION TECHNIQUES POPULATION-LEVEL ASSESSMENTS ABOUT REFERENCES

Bycatch Management Information System

The Bycatch Management Information System (BMIS) focuses on bycatch mitigation and management in oceanic tuna and billfish fisheries*. It is an open resource useful for fishery managers, fishers, scientists, observers, educators and anyone with an interest in fisheries management. As a reference and educational tool, the BMIS aims to support the adoption and implementation of science-based management measures so that bycatch is managed comprehensively and sustainably. The BMIS is concerned with highly migratory species with low reproductive rates, including seabirds, sharks and rays, sea turtles and marine mammals.

BYCATCH SPECIES DATA LINK *Beta Version*

MORE ON THE BMIS >>

Pacific Community Communauté du Pacifique

Western and Central Pacific Fisheries Commission

COMMON OCEANS

Food and Agriculture Organization of the United Nations

Figure 1: The BMIS landing page - the BMIS can be accessed at www.bmis-bycatch.org. Subscribe to the BMIS Twitter feed [@BMIS_bycatch](https://twitter.com/BMIS_bycatch). Questions? info@bmis-bycatch.org

CURATION

Material in the BMIS is continually reviewed and revised.

- 3300+ references in the database
- 50 mitigation technique descriptions
- 15 management category descriptions
- 6 population-level assessment category descriptions
- Bycatch species group summaries, describing interactions with different fishing gears & relevant mitigation techniques etc.

References are collected from many sources. Among these are tuna RFMO scientific meetings (or equivalents, e.g., ICCAT's Collected Volumes of Scientific Papers) and bycatch related workshops, ACAP and Birdlife International factsheets and ACAP scientific meetings. Other sources include ISSF publications and blogs, Table of Content alerts (a selected list of scientific journals), google scholar alerts, ResearchGate and Twitter (X).

Mitigation Techniques (MT) are revised to reflect new research and create new MT as appropriate. Sometimes MT are created to help users find literature within a broad MT category. For example, 'purse seine deck release devices' is a sub-category of 'safe handling and release techniques' but is an area of active research which warrants separate attention.

The **Species Group** pages summarise – for each group - how bycatch occurs in longline, purse seine and gillnet tuna and billfish fisheries. Proven and promising MT are outlined. Links to further information on biological and distribution data, and species identification are included.

Management information in the BMIS provides context and rationale for the development of bycatch conservation and management measures (called **Regulations** in the BMIS). **Population-Level Assessments (PLA)** highlight ecological risk assessment frameworks for estimating the vulnerability and stock status of (data poor) bycatch populations and evaluating potential consequences of fisheries management actions.

Twitter (X) is used to promote the BMIS website, to keep the website looking active, and as a source of reference material, news and events in the wider world of bycatch management. Posts highlight new BMIS content and events, including tuna RFMO meetings and papers.

Website Usage

Visitor numbers and page views

There has been a substantial increase in site visitation, including the number of repeat visitors, since the site relaunch in 2017. Rate of growth was highest 2017 to mid-2019; recent growth has been steady, but site visitation varies through the year (see Figure 2).

Comparing the calendar years 2022 and 2017*:

- page views - 35,228 vs 11,737
- unique users - 16,488 vs 2,350
- return users – 2,446 vs 355 (proportion of total users has remained constant, at around 13% of total users)

* BMIS uses Google Analytics (GA) to investigate website usage. The figures here are derived from Universal Analytics (UA), which has recently been superseded by GA4. GA4 employs very different analytical

methodologies. GA4 data, collected since October 2021, can't be directly compared with earlier years. It forms the basis of the analysis and charts below.

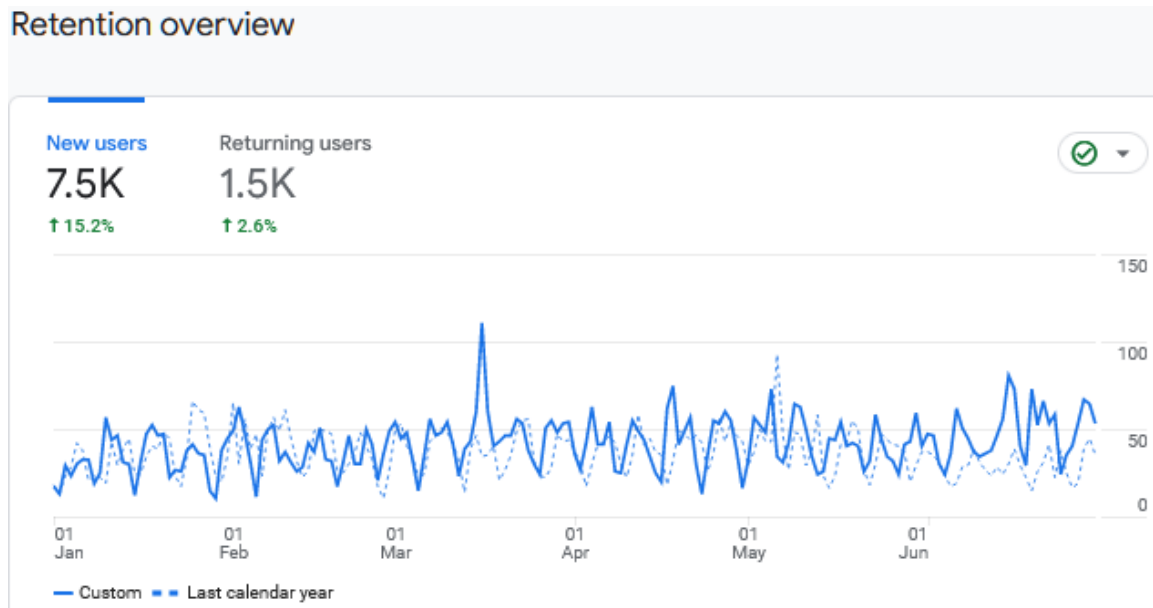


Figure 2 – Comparison of new and returning users for the six month period 1 Jan-30 June 2023 with the same period in 2022.

GA4 will bring greater user insight, enabling analysis of:

- types of engagement (clicks, scrolls and pdf downloads)
- spikes in user engagement
- user channels.

For example, Figure 3 below supports the idea that the BMIS has a solid group of repeat users, as the 'direct' channel indicates users who have either bookmarked the website or typed the URL directly into their browser.

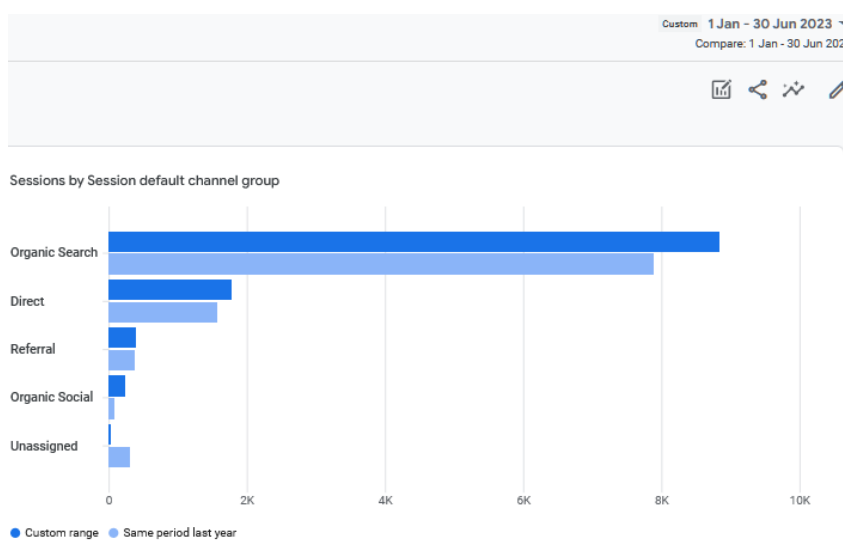


Figure 3 – Graph illustrates how users arrive at the BMIS website. Comparison for the six-month period 1 Jan-30 June 2023 with the same period in 2022.

What visitors looked at

The most heavily used sections of the BMIS are the references and mitigation techniques (Table 1). Curation effort is focussed on these parts of the database.

Table 1 - The pattern of BMIS usage as illustrated by the relative proportions of total page views, for the calendar year 2022.

BMIS Section	Page Views: % of total
References	46
Mitigation Techniques	22
Home page	6
Fishing Gear	6
Bycatch Species Groups	4
Management	3
Regulations	2
Population-level Assessments	2
Miscellaneous	10

Where users are located

The BMIS has a global audience, as shown in Figure 4, below. Whereas predefined regional reports, e.g., summary statistics for the Pacific, were available under Google UA, as yet these aren't available via GA4.

Users ▾ by Country



Figure 4 – Map and table illustrating international usage for the month of June 2023, with the top 10 (of 103) 'countries of origin' listed.

Website functionality

Improvements to the functionality of the BMIS that have been implemented include:

- improved keyword recognition (references) to help to put the most relevant references at the top of search results;
- addition of the option to search references by species scientific or common name;
- improved sorting of search results (column headers);

- improved search results for mitigation techniques when users search by species groups and/or gear (MT can be manually weighted according to relevance in the data entry view);
- improved keyword recognition to locate relevant regulations;
- enhanced data entry options for superseded regulations;
- Drupal (software platform) upgrades.

Projects

Bycatch summary data visualisation and mapping

In 2019, the BMIS website was extended, in a [beta \(test\) version](#), to allow Western and Central Pacific Ocean (WCPO) public domain shark bycatch data to be explored and visualised. The aim was to create an accessible, central source for public domain bycatch-related data, including:

- fisheries effort data;
- observer effort data;
- reported bycatch;
- estimated bycatch;
- species distributions;
- population data;
- risk assessments; and
- related management measures.

The project is being revised to consider lower cost means of data visualisation and update using open source R-shiny scripts. Other aspects to be considered are automated linkages with BMIS management information datasets and expansion to cover seabirds, sea turtles and marine mammals.

References

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