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BYCATCH MITIGATION INFORMATION SYSTEM

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Purpose

The purpose of this information paper is to report on progress in the development of the Bycatch Mitigation Information System (BMIS) and to consider its ongoing management. A description of the database is included.

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1. Introduction

The BMIS is the result of a WCPFC project to centralise and make readily available, information on the mitigation and management of bycatch in the Western and Central Pacific Ocean (WCPO). The database is a reference and educational tool that supports the Commission's responsibilities with regard to the sustainable management of non-target, or bycatch, species in WCPO fisheries targeting highly migratory species, including tuna and billfish.

Specifications for a database system were presented in an information paper at the WCPFC Scientific Committee (SC) meeting in 2007 (Williams 2007, SC3-EB-IP-02). An update on progress with the BMIS was presented in an information paper at the SC meeting in 2010 (Fitzsimmons 2010, SC6-EB-IP-06).

The BMIS was launched on the WCPFC web site in February 2011. It can be accessed at:
<http://bmis.wcpfc.int/index.php>

The screenshot shows the homepage of the Bycatch Mitigation Information System (BMIS). At the top, there is a blue header with the text "BYCATCH MITIGATION INFORMATION SYSTEM (BMIS)" and the logo of the Western and Central Pacific Fisheries Commission. Below the header, there is a navigation menu with buttons for "Overview", "What's in the BMIS", "Contact us", "User Tips", "Links", and "Acknowledgements". On the left side, there are four green buttons: "References", "Mitigation Methods", "Decisions / Regulations", and "Target & Bycatch Species". Below these buttons is an RSS feed icon with the text "View with Feedburner". The main content area is titled "Overview" and contains the following text:

The Bycatch Mitigation Information System (BMIS) is a resource for fisheries managers, scientists, fishers and the general public. It is provided by the [Western and Central Pacific Fisheries Commission](#) (WCPFC), as a central repository of information on the mitigation and management of bycatch in the Western and Central Pacific Ocean (WCPO).

In the context of the BMIS, "bycatch" mainly refers to those species of special interest, such as seabirds, sharks and marine turtles, that are incidentally caught in WCPO fisheries targeting highly migratory species, including tuna and billfish. Much of the information in the BMIS is relevant to bycatch mitigation in similar oceanic fisheries around the world.

Guided by the WCPFC Conservation and Management Measures (CMMs), fisheries in the WCPFC Convention Area are required to "...minimise...catch of non-target species, both fish and non-fish species...and promote the development and use of selective, environmentally safe and cost-effective fishing gear and techniques" and to "protect biodiversity in the marine environment".

The purpose of publishing the BMIS on the WCPFC website is so that its content may be easily shared among WCPFC Cooperating Commission Members, cooperating non-members and participating territories (collectively known as CCMs), and other stakeholders. This content will be continually updated.

Note that the inclusion of any particular studies on bycatch mitigation methods and management decisions does not imply endorsement by the WCPFC except where specifically noted, e.g. under "Decisions" and in the technical specifications for WCPFC Conservation and Management Measures (CMMs).

At the bottom of the page, there is a blue footer with the text "Western and Central Pacific Fisheries Commission - 2010-2011".

2. Database Description

Audience and purpose

The WCPFC BMIS is a resource for fisheries managers, scientists, fishers and the general public. It is a central repository of information on the mitigation and management of bycatch in the WCPO. The BMIS is published on the WCPFC website so that its content may be easily shared among Cooperating Commission Members, cooperating non-members and participating territories (collectively known as CCMs) and other stakeholders. Content is continually updated.

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The BMIS is a valuable reference and educational tool which has the potential to build understanding of bycatch issues among those involved in tuna fisheries and thereby assist in the adoption of WCPFC Conservation and Management Measures.

Content

There are several sections to the BMIS. These include **references** (scientific and technical literature), technical **mitigation methods**, **decisions** by WCPFC and other management bodies, and a **list of target and bycatch species**. **Links** to other websites and documents of interest and an **RSS feed** are also features of the database.

The **references** section focuses on seabird, shark and turtle bycatch mitigation methods relevant to the longline, purse seine, pole and line and troll tuna fisheries of the WCPO.

Reference types include peer-reviewed papers in scientific journals, meeting papers (including papers submitted to meetings of the WCPFC and its subsidiary bodies), project reports, fact sheets, and official guidelines from the WCPFC, CCMs, or other Regional Fisheries Management Organisations (RFMOs). The full citation and abstract are listed for each reference; key points have been added in some instances.

BMIS descriptions of **mitigation methods** summarize the latest knowledge on bycatch reduction methods. For example, there is a discussion of circle hooks and how they affect turtle and shark bycatch. Descriptions may contain notes on cost, ease of deployment, need for further research and compliance issues.

The BMIS also houses links to WCPFC **decisions** (Resolutions and Conservation and Management Measures) and those of other tuna RFMOs that refer to and/or require the use of particular mitigation methods to protect seabirds, sea turtles or sharks.

In addition, it is possible to search a list of target and bycatch **species** recorded in the WCPO Observer Database. Only those species that have been noted as 'caught by gear' are included. Scientific and common names, as well as Species Identification Codes, are tabulated.

The **links** tab is divided into sub-sections - Seabirds, Sharks, Turtles, Gear, General, Other Bycatch Databases and Pacific Island Fisheries. Links to websites and documents of interest, such as International Plans of Actions for seabirds and sharks, SPC's Longline terminal gear identification guide and FAO's illustrated shark catalogues. Species identification guides can be accessed here.

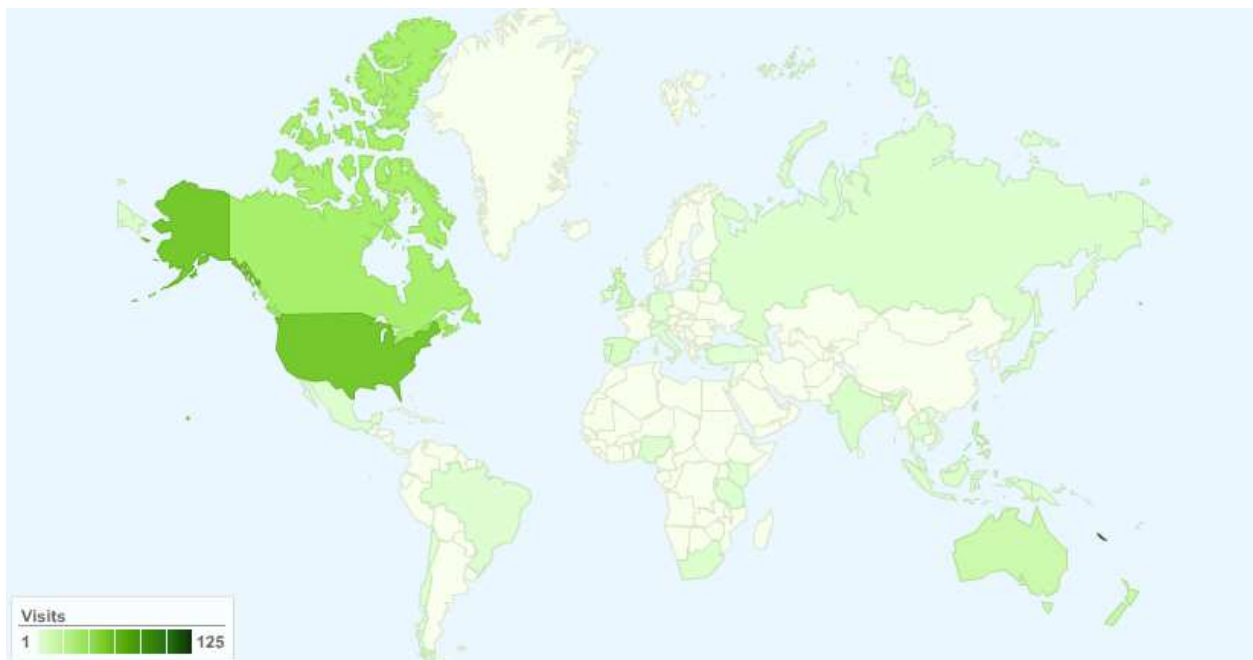
An RSS feed has been added. Subscribers are notified of significant changes to the BMIS (such as updates to CMMs) and bycatch mitigation news.

3. Progress since August 2010

Website traffic analysis

Since February this year the BMIS website has been hosted on the WCPFC web server (it was previously hosted by SPC - the Secretariat of the Pacific Community). A traffic analysis tool has been embedded in the website. This means that the number of visitors to the site, the countries where visits originate and the number of return visits by individual users can be tracked. It is possible to see how often different pages within the site are being viewed and for how long (on average) visitors stay at the site. For example, in June 2011, 222 people visited the site, with 375 visits overall and visitors came from 40 different countries. Additionally, details of how visitors found the site, e.g. whether by organic Google search (including what search terms they used), referral from the WCPFC or SPC websites, or directly to the web address, are recorded.

Site traffic will be reviewed at regular intervals.



References

The number of references in the database has continued to grow. More than 250 documents touching on ways to mitigate bycatch of seabirds, sea turtles and sharks have been entered in the database.

An automated system to assist in keeping abreast of relevant literature has been developed. This system simply utilises (a) journal contents alerts and (b) tailored Google alerts. Contents alerts are received from 45 journals (5 other journals are flagged for 'manual' review). Google alerts provide leads to useful documents, as well as information on what has been happening in the media and advertising e.g. the Greenpeace campaign on FADs and developments in magnetic shark repellent products.

Descriptions of mitigation methods

The description for 'Smart Hooks' has been significantly revised and material compiled in preparation for writing other descriptions in the second half of 2011.

Links

From the BMIS home page you can select a 'Links' tab. There are links to useful bycatch information e.g. species identification guides, safe handling guidelines, mitigation factsheets, Pacific Islands fisheries reports, other bycatch databases and fisheries acronyms. Since last August more Links have been added and the section reorganised under sub-headings.

RSS feed

We are trialing the implementation of an RSS news feed facility. Subscribers to the feed will be advised of significant updates to the BMIS, e.g. revised Decisions or Regulations, and bycatch news, e.g. 'Ship sails in search of sustainable tuna'. One-off visitors to the BMIS website can click on the RSS icon to view a list of recent feeds.

BMIS Administration Guides

Two guides were completed, both will be revised as necessary:

BMIS Ongoing Maintenance Strategy

This document outlines what needs to be done to manage the BMIS and keep it current. It lists tasks to be completed, files used, and gives worked examples of, for example, how to enter a reference. Additionally, it refers to options for further development.

Database and Code Publishing

This guide outlines what needs to be done to keep the BMIS current on the web site. It lists tasks to be completed in order to update the BMIS database, code and documents stored on WCPFC servers.

Training module developed

Fisheries managers from across the WCPO who were in Noumea in June for SPC's annual Stock Assessment workshops, also attended an Ecosystem and Bycatch Workshop on June 27. At the latter workshop, participants learned of the background to the development of the BMIS, were shown how the database might be useful to them and instructed in the use of the BMIS.

As fisheries managers, it was explained that the BMIS aimed to assist them to:

- understand seabird, shark and sea turtle bycatch issues
- be informed about bycatch mitigation methods
- access relevant rules and regulations e.g. CMMs
- access background information, e.g. species identification guides, International Plans of Action
- provide a resource to which they could refer others interested in bycatch reduction.

The workshop was a great opportunity to meet users and potential users of the BMIS and to find out what they thought of the database and how they thought it could be improved. A feedback form was distributed. Feedback from the workshop will be valuable in improving the content and functionality of the database and developing a 'User Help' module.

Promotion

A range of activities to promote the BMIS were completed and are discussed below.

4. Promotion and Feedback

An outline of completed or upcoming promotional activities follows:

Emails

Emails were sent to a list of academic and industry contacts to briefly outline the BMIS, request comment and to ask that they forward the information to those they think might be interested. More emails will be sent in coming

months. Records are being kept of email recipients and feedback (details include name, date received, organisation, full comment, summary of feedback for consideration or action and a note of whether comment has been addressed). Positive and constructive feedback has been received and recorded.

A selection of comments:

- comprehensive resource and a great place to search bycatch information
- very important resource
- this kind of database would be useful for anyone involved in the bycatch issue
- this database is a huge step forward in filling that gap (capacity building): it identifies what fishing states (and fishers) must do and shows them how and why a given measure will work
- is a very worthwhile endeavour
- A really needed and useful summary of what has been done in the framework of all the tuna RFMO's. The reference section is simply great if you want to work in any bycatch related issue.
- It looks like a very useful database, and we will certainly benefit from having this information in one place.

Constructive comment included ideas on ways to improve the functionality of the website interface (e.g. ease of searching) and suggestions for additional content.

Workshops

Participants at Data Management, Stock Assessment and Ecosystem Monitoring and Assessment workshops held at SPC in Noumea were made aware of the BMIS and asked to comment.

Training of WCPO fisheries managers in the use of the BMIS was conducted at the Ecosystem and Bycatch Workshop, as detailed in Section 3 above. Workshop participants were generally complimentary about the database. The notion of a 'one-stop shop' for bycatch information was of great appeal. The centralised access to e.g., International Plans of Action and references, was mentioned as useful for report writing (such as National Plans of Action). Many commented that the BMIS was very useful and that they intended to use it to help with their work (some were already using it).

News Articles

An article about the BMIS was published in the June issue of the SPC Fisheries newsletter. About 750 copies of the newsletter are printed and distributed around the Pacific. In addition, around 660 people/ organisations are advised by email that the newsletter is ready to be downloaded from the SPC website. It is hoped that this article will generate a few hits to the website.

An update on progress with the BMIS was published in the WCPFC news in June.

More Feedback

More feedback is needed. Your input would be appreciated - please take a look at the website and use the contact facility provided or email larissaf@spc.int.

5. Work to be completed by February 2012

Development of the BMIS is funded until February 2012. In addition to keeping the literature in the database up-to-date, a number of other tasks are planned for completion by this time:

Descriptions of mitigation methods

Developing detailed descriptions, or reviews, of techniques to reduce bycatch is a time consuming task. In the first instance the goal will be to compile short explanations for all as-yet-incomplete mitigation method descriptions (there are 37 methods listed in the database). Development of more detailed descriptions will follow.

The BMIS is a 'living document', especially with regard to descriptions of mitigation methods. Descriptions will always need to be revised as new information comes to light. For example, a circle hook symposium was held in Florida in May and the results of discussion will be available later in 2011. Outcomes should be integrated in the BMIS as circle hooks are one of the most promising methods of reducing turtle bycatch but also, their impact on shark bycatch is not well understood and any new information will of interest.

User Help

A User Help guide will be developed.

Promotion

- Further comment on the BMIS (from species experts and others) will be sought and feedback recorded.
- A press release will be made.
- Website traffic will be monitored and reported upon.
- A BMIS Factsheet will be finalised. It will be available via the website but also distributed at observer and other workshops, and sent to WCPO fisheries officers.

Database Function

Improvements to the functionality of the BMIS will be made, to improve ease of use and search results.

Administration

The Administration Guide (for both database and website) will be updated.

An estimate of staff resources (time) needed to ensure continuity of the BMIS will be made and an outline of suggestions for further enhancement of the BMIS (see Section 6 below) developed.

6. 2012 and Beyond: maintenance and further development of the BMIS

There are a number of ways in which the BMIS could be further developed. These are outlined in brief, below:

Relevance to other tuna RFMOs - Kobe III Bycatch meeting July 2011

As mentioned earlier, much of the information contained in the BMIS is relevant to other tuna RFMOs. A clear outcome of the recent Kobe III tuna RFMO bycatch meeting was a recommendation to make the BMIS a standard for all tuna RFMOs. There was interest in improving the capabilities of the BMIS in several areas:

Inclusion of non-English references. The BMIS is well able to accommodate non-English literature (filters to enable searching by language would need to be added). The inclusion of non-English material raises the question of what languages BMIS explanatory text should be translated into, or whether it would be worthwhile to have different language versions of the BMIS.

It might also be relevant to ask WCPFC CCMS what, if any, sections of the BMIS they would like to see translated into particular languages.

To establish and keep current the non-English literature component of the BMIS, it would be necessary to nominate staff at each RFMO to be responsible for collating and forwarding non-English technical reports and other reference material to the BMIS coordinator. The nominee at each RFMO could also be responsible for advising the BMIS coordinator of updates to RFMO Resolutions/ Regulations and of other relevant information, e.g. research programs that the RFMO is involved in (see below).

RFMO research programs. A list of current and upcoming research conducted or supported by tuna RFMOs could be compiled and accessed via the BMIS. This would help to avoid overlap and ensure the efficient use of limited

research resources. The list might include an outline, timetable and contacts for the research program, i.e. who is doing what, where and when. Such information would also be useful for scientists in government and academia, as well as NGOs.

Country reporting on bycatch reduction measures. With regard to the WCPFC, the BMIS could provide access to a summary of CCM annual reports which demonstrate how CMMs for bycatch species have been addressed (this would make it easy to see, for example, what countries adopted line weighting as a mitigation measure and for what period of years). RFMOs other than WCPFC will have their own bycatch reduction measure reporting arrangements, but these could be similarly summarised in the BMIS.

Co-existing reference databases. ICCAT has a database of bycatch references which could be incorporated into the BMIS.

Comments

If the capabilities of the BMIS are expanded to cater for other RFMOs, a limited reorganisation of the website would be advisable to accommodate and meet specific regional needs, i.e., to ensure there were areas devoted to idiosyncratic issues of the WCPO, Eastern Pacific Ocean, the Atlantic Ocean, the Indian Ocean, etc.

There would be a range of other issues to consider, such as the inclusion of reference material on marine mammals (and thus an expansion in the list of mitigation methods and in increase in the time and effort to collect and collate reference material) and changes to the list of target and bycatch species (would need filters to enable searches by RFMO region).

Additionally, an expanded BMIS might provide an access point for, e.g.:

- meeting reports of ecosystem working groups and symposium
- details of assistance programs - funding for industry adjustment to implement new gear and techniques.

Feedback from the Ecosystem and Bycatch workshop included the comment that it would be useful to have more bycatch information from other RFMOs available via the BMIS.

Author Profiles and reference access

Author profiles could be developed for a number of researchers in the bycatch mitigation field. Part of the reason for doing this is to improve access to many of the documents in the database which at the moment are only available through 'pay-to-view' websites. A link to the personal web page of researchers who are authors on multiple references in the BMIS can provide free access to documents that we don't have copyright to provide.

BMIS Wiki

A wiki or blog may be an appropriate way to share ideas among Pacific Ocean fisheries managers, fishermen and the fishing community in general.

For example, there are many options for building cheaper versions of commercially manufactured bycatch handling devices such as line cutters and dehookers. Providing photos and instructions via a BMIS Wiki could be a practical way of sharing information.

At the recent Ecosystem and Bycatch workshop in Noumea, participants were shown how to build a line cutter for a few dollars using a seat belt cutter (available free from SPC) and a broom handle. An image of a dehooker built from a bolt (with a niche cut) welded to steel pin was also shown.

Links to places where free materials can be obtained could be included.

Marine Mammals

One of the issues raised by participants at the recent Ecosystem and Bycatch Workshop at SPC was the inclusion of reference material about marine mammals in the BMIS. A number of people supported this suggestion. At present there are no WCPFC CMMs on marine mammals.

BMIS website

The BMIS website would benefit from being upgraded (made more visually appealing). Examples of website designs that might work for the BMIS include the Oceanwatch website at <http://www.oceanwatch.org.au/> or SPC's TUMAS <http://www.tumas-project.org/>

Economic benefits of bycatch reduction techniques

An effective way to encourage the adoption of bycatch mitigation methods is to demonstrate the economic benefits of doing so. Not surprisingly, participants at the recent Ecosystem and Bycatch Workshop indicated an interest in studies of the economic benefits of implementing bycatch techniques. It would be useful to discover what information is available and, if little can be found, to document or demonstrate a need for it.

There are different kinds of economic studies that could be useful, e.g., at the micro level, a study that quantified cost-benefits on a fishing vessel where the adoption of circle hooks increased target catch but reduced catch of non-target though saleable species (and altered the size distribution of all catch). Among the considerations of such a study could be estimates of the costs (resources and time) in implementing a suite of bycatch mitigation measures, such as safe handling practices and hotspot avoidance, in addition to circle hooks.

Another kind of study might take a much broader scale look at the economics involved, e.g., when public perception of the sustainability of a fishery affects the saleability of product (such as the Greenpeace campaign to eliminate fishing on FADs and the move by supermarket chains to source FAD-free tuna).

7. Resources

Lastly, but most importantly, the BMIS will only retain its relevance and usefulness if it continues to receive recognition and support from the Commission and CCMs.

The BMIS is a 'living document' and requires active management to keep content current. Information needs to be collected, analysed and integrated on a regular basis. Staff need to be available to respond to user enquiries and contributions, and make technical changes to the database and user interface where necessary.

With continued focus and dedicated resources, the BMIS will act not just as a repository of WCPO bycatch mitigation and management information, but also as a valuable reference and educational tool supporting WCPFC management responsibilities.

8. References

Williams, P.G. 2007. Specification of a database system to manage and facilitate access of information covering (i) by-catch and (ii) by-catch mitigation on behalf of the Western and Central Pacific Fisheries Commission (WCPFC). WCPFC-SC3-EB-IP-2.

<http://www.wcpfc.int/doc/eb-ip-2/specification-a-database-system-manage-and-facilitate-access-information-covering-i-catch>

Fitzsimmons, L. 2010. WCPFC Bycatch Mitigation Information System (BMIS). WCPFC-SC6-EB-IP-06.

<http://www.wcpfc.int/node/2926>