# COLTO, Science & Suppliers Workshop #1

## SUMMARY OF PRESENTATIONS AND DISCUSSIONS

### THURSDAY JUNE 25TH – Workshop Day 1 – Chair: Martin Exel

#### 08:30 – 10:20 SESSION 1 - Where we have come from and where is our current state of knowledge / challenges at?

**Topic: Meeting opening and COLTO's perspective**
**Presenter: Martin Exel (COLTO Chair)**

Martin outlined the history of COLTO, which developed following a second series of illegal fishing for toothfish (ISOFISH was the first industry group formed to chase away illegal fishing), and COLTO started in 2003. The primary aims were to eliminate IUU fishing for toothfish, to minimise the incidental bycatch of seabirds, and ensure sustainable fishing for toothfish. He highlighted those achievements, and also outlined options for progress, following this workshop.

**Topic: Science perspective**
**Presenter: Dr Dirk Welsford (Australia) and Dr Chris Darby (UK)**

Dirk outlined how the proposal for this workshop had origins in his link with Stuart Hanchett when they were reviewing fisheries in the Falkland Islands (Malvinas). He was keen to see an opportunity to provide for increased exchange of science and industry perspectives across all toothfish fisheries, as well as improved collaboration between science and industry.

Chris built on this, in seeking to encourage practial, achievable outcomes and goals for industry and science; provide positive feedback to CCAMLR, and work together towards positive outcomes.

**Topic: Supplier industry perspective**
**Presenter: Trond-Inge Kvernevik (Fiskevegn) and Anders Frisinger (Mustad)**

Both speakers provided valuable background and insights to their operations.

Trond-Inge outlined his view that logistics are critical to the industry; for example it's often time-critical to organise fishing gear to boats for the season start dates. He focused on relationships between gear suppliers and technologists and the industry/scientists as being the main step to success. In this regard, he felt there was a need in all the fisheries for adequate resources; adequate fleet; adequate marketing to ensure sufficient stock, with a quality product, and quality, consistency, availability were the keys to success.

As suppliers, he felt they could contribute via a balance of four aspects: improved efficiencies of capture (reducing costs); reduced impact on the environment; market value of seafood; and facilitating science. He identified opportunities for collaboration at the "pre-competitive" levels between fishermen, scientists and suppliers that may otherwise normally be direct competitors, and used medical research as an example of how this can work well.

Anders outlined the history of Mustad Autoline, having started production in 1832 in Gjovik, Norway, and invented the first automated longline machine in 1877. He outlined the need for collaborative approaches, and investment in our futures – both directly as a funding model, but also in terms of collaborating as an investment for all involved with toothfish, and the environment more broadly.

Anders explained that a 10% of turnover has been the standard investment for Research and Development in Mustad Autoline over the years, and that was the key to success of the industry, as well as the machines and technology that Mustad Autoline produces for our fisheries.

**Topic: Round Table expectations for meeting**

All of the participants were given the opportunity to outline what they hoped to get out of the meeting. A common theme throughout was based on increased collaborative programs; working to improve our scientific understanding and communication of science from toothfish fisheries; and exchanging ideas and approaches amongst other participants.

## 10:50 – 12:00 SESSION 2 – Substantive challenges from a science perspective

**Topic: Stock Assessment Fundamentals**
**Presenter: Dr Philippe Ziegler (Australia)**

Philippe provided an outline of Toothfish Stock Assessment fundamentals, and how that provides a comprehensive understanding of fish stock and fishery.

He warned that data provision and accuracy from industry is critical to accuracy of the outputs, and the benefits of observer programs are also evident in validating industry accuracy.

His concept of "Garbage in = Garbage out" was a key message for industry; with inputs critical to the success and future of toothfish fisheries, it is in the direct interest of industry to ensure high quality data is provided for science.

**Topic: Marine Stewardship Council (MSC)**
**Presenter: Dr Rohan Currey (New Zealand)**

Rohan outlined the fundamentals of the MSC concepts. He explained how the MSC Standard assesses fisheries against 3 Principles: Fish stock, environmental impact, management practices.

Conditions on the Ross Sea certification required collaboration between industry and science to achieve scores that would meet the high standards of MSC. All of those initial conditions are now completed, although a number of them involve ongoing research and collaborative programs.

He posed a number of questions for the participants, including how we can best develop and answer research questions that span multiple fisheries, and how the industry could make linkages to ensure research plans and programs are more cost-effective and efficient (as opposed to having numerous separate research programs duplicated across many fisheries).

**Topic: Data Monitoring Systems**
**Presenter: Dr Steve Parker (New Zealand)**

Steve outlined details of the Ross Sea Research Plan for MSC certified fishers, which aims to decrease uncertainty in the stock assessment model parameters.

The primary goal is to ensure that CCAMLR can continue to maintain Antarctic Toothfish populations at or above target population levels; to maintain ecosystem function and structure, and to take account of impacts not just of the target species, but also bycatch species, predators/prey of toothfish; and the benthic and marine environment that toothfish live in.

He highlighted the benefits of data that are collected by fishing vessels, observer data/samples, fishery independent surveys as combining to improve the understanding and accuracy of assessments.

He also explained how the tagging programs across Toothfish fisheries are unique in the world, as they use crew and observers, along with scientists, to complete the tagging program, and the success of the Toothfish tagging program provides an example which could benefit other fisheries.

**Topic: Science role in reducing seabird bycatch in CCAMLR fisheries**
**Presenter: Dr Keith Reid (CCAMLR Secretariat)**

Keith outlined how CCAMLR deal effectively with the elimination of seabird bycatch via a number of mechanisms, coordinated through the Working Group on Incidental Mortality in Fisheries, which was an expert WG established with industry and scientists collaborating to achieve solutions, much as this workshop was seeking to achieve.

He noted that the global best practice that CCAMLR is now recognized as having for ensuring minimal interactions with seabirds came from the concept of three basic premises "Avoid, Mitigate, and Regulate".

A suite of mitigation methods are used across CCAMLR fisheries, including night setting, line weighting, streamer lines, no offal discharge, seasonal closures, and light reduction at night.

He outlined some case study results:

- South Georgia – 1997 = 5,775 birds died. 2003 = 0 birds. 2006 = 0 birds
- French EEZ – 2003 = 13,926 birds died. 2011 = 155 birds. 2014 = <10 birds

**Topic: Mitigating whale depredation on demersal longline fisheries by changing fishing practices**
**Presenter: Dr Paul Tixier and Dr Nicolas Gasco (France)**

Paul outlined the global trend towards whales learned behavior, and increasing depredation on longlines, including in toothfish fisheries. As an example, their calculations for Killer whale depredation around Crozet Islands estimated that, from 2003-13, an average of up to 200t/yr of toothfish was taken from longlines. The stock assessment takes account of these events, but it still creates economic issues for the industry.

Nicolas outlined the program of identifying different individuals with photos, which has been operating since 1997, and is very successfully being used now to assess which whales have learned behavior, and what roles in the overall system they play.

They outlined some of the methods for calculating fish loss, which included Catch Per Unit Effort comparisons to lines when whales are sighted, versus lines when no whales are present; the use of 'indicator' bycatch species such as grenadiers (which Killer whales don't depredate) to calculate how much Toothfish would have been otherwise on the line, and the use of evidence, such as heads, or lips, left on the hooks after depredation events.

Paul outlined four options being used to reduce the amount of depredation including:

1. shorter lines - less than 10,000m were better (can haul faster and move)
2. speed of hauling - hauling speeds that are higher can reduce depredation
3. distance travelled when there are sightings - need to travel greater than 75 km to avoid being followed

4. Seasons for no fishing, once whale behaviour is well understood, as there are periods of the year when they are not in the region.

**Topic: Next phase of Orca-Depredation program**
**Presenter: Dr Christophe Guinet (France)**

Christophe outlined options for next steps to investigate the operational and technological options for creating solutions with depredation issues. They included concepts such as:

- Photo ID, satellite tags, acoustic tracking
- Try to answer if whales are taking fish from the longline on the seafloor (if so, how much?)

He indicated French researchers will be using a vertical hydrophone array to measure vessel noise and assess Captain's operational tactics, in an effort to understand whether it will be more cost efficient to modify vessels (to reduce/alter noise patterns that whales may associate with) or to implement tactics of avoidance (i.e. to move 75+ miles away).

Christophe made the point that operational changes (i.e. skipper behavior / boat noise / moving away) can greatly reduce depredation, but not eliminate it. Technology is required to eliminate depredation entirely, so it needs to have a collaborative effort from science, industry and technologists to achieve the best results.

## 13:00 – 14:30 SESSION 3 - Substantive challenges from a gear industry perspective

**Topic: Fiskevegn developments**
**Presenter: Trond-Inge Kvernevik (Norway)**

Trond talked about the approach that this company is taking to assist customers deliver on their objectives. They are working towards stronger longlines with new polymers which they hope will result in less gear loss, increase in vessel storage space, and increase in fishable depth.

Synthetic bait project is developing and they have a prototype that is positive at this stage of development. Part of the project is the search for a decent attractor in the form of an odour that can target a particular species, rather than generic baits. They are even considering the concept of getting a map of the toothfish genome, in order to improve the work being done to directly target attractants for this species.

Trond is promoting more instrumentation for passive gear in order to improve the amount of information that the industry gather on their gear; for example, to ensure lines are being set in the right temperature ranges.

Fiskevegn is looking to the use of "precision fishing gear" (sonar bell) which will more accurately target areas for setting lines, and allow operators to better recover lost gear.

They are also testing the Marine Avian Dissuader machine, using a laser plus variety of noises to scare away birds, such as barking dogs, hawks, and even a velociraptor!

**Topic: Mustad Autoline developments**
**Presenter: Arne Tennoy (Norway)**

Arne outlined the history of Mustad Autoline equipment, and noted that around 90% of all systems currently are Mustad Autoline. He explained the details behind the Super Baiter, which is capable now of baiting hooks at 6 hooks/second – a dramatic increase over past hook baiting rates, and an improvement in baiting success at slower speeds is also likely.

Haulers can haul at 80 hooks/minute which exceeds the capacity requirements for many deeper water fishing operations, but can be extremely useful for rapid hauling in shallower waters to avoid depredation by Killer whales, for example.

They have found it difficult at times to get approval for testing of new technologies. Believes industry can help encourage governments along, for example when testing seabird lasers to avoid the bycatch of seabirds on longlines.

Arne outlined how it was clear that new technology is the way forward – both with autoline equipment and vessel technology, to mitigate depredation, avoid seabird bycatch, and catch toothfish efficiently and effectively.

In that respect, he noted the concept of hauling wells built into hauling stations as an alternative to moon pools and also reduce gaff marks and loss of catch; and Arne was keen to collaborate and work closely with industry to solve problems, as they are identified.

**Topic: Save Wave developments**
**Presenter: Ernst Schrjiver (SaveWave)**

Ernst outlined some of the programs that SaveWave has been involved with over recent years, and the awards they have received for successful introduction of technology to reduce seabird bycatch, in particular.

They have developed a new version of OrcaSaver that can sing multiple tunes, at multiple different frequencies, to deter whales from depredating on longlines. The new noises can be uploaded via an SD card, to ensure that skippers can create their own 'mix' of sounds at the time, and change them around as whales perhaps become more used to the sounds. Ernst believes that it may be ncessary to use different songs for different species, different pods, different areas, at different times of year – all of which is possible with the SD card and new options on OrcaSaver.

SeabirdSaver laser tests show it working extremely well in low light conditions. In response to concerns from ornithologists about the impact of lasers on seabird eyes, the design has reduced the strength of the laser from a 4 to a 3b (which is the same level as used at airports

to deter birds). Testing showed that sound was a nice complement, but not as effective as laser, and created some problems for the crew having loud noises in their ear constantly. They have incorporated the ability to rotate the laser, and also a horizon block, so as to not shoot the laser up into the sky.

Ernst explained there are multiple other 'Saver' device for Shellfish and Seals/Salmon; including the Seal Salmon Saver which has recently been trialed with Sperm whales in Alaska when the Captain could see them below the vessel on the sounder. A two-millisecond pulse is emitted to 'scare' the whales away, and early results look to be positive.

## 14:45 – 16:30 SESSION 4 – Harvest strategies and Marketing

**Topic: UK Harvest strategy approaches**
**Presenter: Dr Chris Darby (UK)**

Chris presented an outline of stock assessment, noting there are three main considerations, being what is the state of the stock currently; what happened to the stock to get to there; and what can be done to rebuild/fish/leave the stock.

He noted that understanding catchability and selectivity can help in determining the best 'yield per recruit' for a fishery.

Chris also explained the CCAMLR harvest strategy rules, where CCAMLR limits the fish down level to 50% of virgin spawning biomass for toothfish, which ensures that (with a 90% certainty) at least 50% of the spawning stock biomass will be retained for future production of the fishery, and/or as prey for other species.

He noted that many toothfish fisheries have minimum depth closures. South Georgia is closed for waters shallower than 700m, and many others are closed in waters shallower than 500m which provides protection for juveniles, as well as habitat.

Chris raised the issues surround Social Media, and how management, industry and science is increasingly being influenced by external parties, many of whom did not fully understand the science or background to toothfish fisheries.

**Topic: Australian Harvest Strategy approaches**
**Presenter: Dr Dirk Welsford (Australia)**

Dirk provided an outline of the Australian toothfish fishery, and history of how the fisheries were developed.

He also outlined some of the main collaborative research programs, such as the 20 days fishery independent Random Stratified Trawl Survey undertaken every year since 1997 on an industry vessel; joint research programs on underwater cameras and benthic assessments, and broader cooperative programs.

**Topic: CCAMLR Exploratory Fishery approaches**
**Presenter: Rohan Currey (NZ)**

Rohan separated CCAMLR New and Exploratory fisheries into 3 categories:

- Ross Sea – Assessed comprehensively, with ongoing data collection, and surveys planned to address key information gaps. Suggested a need for industry and scientists to collaborate and support surveys, along with tagging programs;
- Amundsen Sea – Assessments being developed, with data collection underway, but not yet well planned. He suggested it would be beneficial to fish in previously fished areas, to get an idea of any 'regional depletion' issues, or stock health in those regions.
- The remaining high seas areas – 48.6, 58.4.1, 58.4.2, 58.4.3, 58.4.4 – which are "data poor" but have some research underway. He identified the benefits of developing collaborative research proposals with a view to improving the understanding and health of the various fisheries.

He talked about some of the complicating factors for New and Exploratory Fisheries, such as where tag recaptures may be low in some areas, because ice coverage limits the ability to fish those areas year after year. That, and other aspects, needs to be taken into account when modeling the populations, and impacts of fishing on future spawning stock biomass.

**Topic: US market overview**
**Presenter: Barry Markman (US)**

Barry provided a comprehensive outline of the USA market for toothfish, including the history and current status of toothfish consumption and pricing. He believed it was clear that the COLTO and collaborative science/industry work behind certifications from both the Marine Stewardship Council, and the Monterey Bay Aquarium Seafood Watch Program had helped the USA market better understand and appreciate that toothfish fisheries were healthy, or in recovery, and it was positive in terms of the overall message for toothfish.

He believed there is still a lot of negative connotation attached to toothfish at the general public level, with many people still thinking of toothfish as threatened, or endangered, by illegal fishing – contrary to the actual situation. Clearly there is a need to collaborate and improve the messaging and promotion of toothfish fisheries in a better way, so the public can be assured that the fish are from healthy, sustainable fisheries.

## FRIDAY JUNE 26TH - Workshop Day 2 – Chair: Martin Exel

### 09:00 – 13:00 SESSION 5 - Day 2 will focus on achieving real outcomes from the issues presented on Day 1

**Major discussion points:**

**There were three main areas of agreement identified in the first day, and the discussions were separated into those headings:**

1. **Market / Promotion:**

Positive discussions about opportunities to better promote the message of sustainable, and science based mangement of toothfish fisheries, including ideas such as attending different shows (e.g. the Chicago National Restaurant Association show) and other promotional opportunities. In terms of collaboration, there was a belief that more value (and greater public understanding) could be achieved through incorporation of easy to understand scientific advice in future.

There was a broader discussion about the concept of 'social audits' for crew practices, safety of vessels, and so forth. It was agreed these aspects were important to maintain a focus on in future.

2. **Science-Industry Collaboration**

It was noted there was scope for programs that spanned all fisheries, which could provide significant scientific benefits – such as for example the concept of having data loggers on every longline set for toothfish, to gather temperature, salinity and other information. This data collection, in turn, could be used to assess the levels of ice melt, changes to sea temperatures, and other oceanographic programs.

Additional programs were also suggested, and it was agreed to identify a number of collaborative programs in the first instance, and then implement them (e.g. use of GoPro cameras on longlines to gather increased information on seabed types, and interactions).

To help understand the current levels of scientific collaboration, all industry members gave a summary of the scientific programs their vessels employ, which included as a base line the implementation of the rigorous CCAMLR data collections and scientific programs (such as carrying observers on every fishing trip for 100% of the trip to gather information and data)

| Country | CCAMLR | Met data | Acoustics | Bird/ Whale obs | Biological samples | Surveys | Benthic Studies | Tagging | Oceanographic |
|---|---|---|---|---|---|---|---|---|---|
| Australia | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Falklands (Malvinas) | ✓ | | | ✓ | ✓ | | ✓ | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Korea | ✓ | | | ✓ | ✓ | | | ✓ | ✓ |
| Norway | ✓ | | | ✓ | ✓ | | | ✓ | ✓ |
| NZ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RSA | ✓ | | | ✓ | ✓ | | | ✓ | |
| Chile | ✓ | | | | ✓ | | | ✓ | |
| France | ✓ | | | ✓ | ✓ | ✓ | | ✓ | |

**3. Depredation:**

It was clear after Day 1, that depredation by Sperm whales and Killer whales was an emerging issue in all toothfish fisheries, and was already an issue in some of the fisheries.

The various technology changes, and operational solutions that have been trialled were discussed, and agreement reached on the need to better coordinate programs across the Southern Ocean. It was also considered valuable to invite experts from other fisheries to participate in a workshop, focused on the issue of minimising depredation.

Stock assessment impacts of depredation were also discussed – with an evident number of different approaches being taken by scientists around COLTO fisheries. Again, it was felt there would be benefits in creating a focussed approach to the issue, and ensuring that impacts of depredation are correctly taken account of in stock assessments for toothfish.

It was agreed that a COLTO toothfish depredation workshop should be developed in the first instance, with the aim being to identify longer term solutions.

**Following all the discussions, the meeting agreed to the creation of three Working Groups to be responsible for progress in the following areas. Those groups were tasked with first clarifying their Terms of Reference, and then to develop concepts with budgets and proposals for the broader COLTO membership, and toothfish scientists, to consider and implement, as agreed.**

1. **<u>Marketing and education Working Group</u>: to create a marketing plan for toothfish, including budget, timing, opportunities, events, as well as identify opportunities to improve the general public levels of understanding of toothfish fisheries more broadly.**

   Nominees at the meeting were: Barry Markman (Chair), Zachary Mazzetta, Joe Chekouras, Mike DellaGrotta, Janet Robertson, Geir Solvag, Dylan Skinns, Alexander Slinning, Anders Frisinger, Marcos Osuna.

2. **<u>Depredation Working Group</u>: to create a plan for a toothfish depredation workshop in 2016, including budget, date, venue, possibilities for collaborative research, stock**

**assessment impacts, operational/technical possibilities.**

Nominees at the meeting were: Paul Tixier (Chair), Richard Ball, Jean Pierre Kinoo, Egil Moe, Arne Tennoy, Ernst Schrjiver, Tim Cotter, Andres Franco, Chris Darby, Eduardo Infante.

3. **<u>COLTO Fisheries Science Partnership Working Group</u>: to agree on up to 6 science programs that could work collaboratively with science and industry. Create proposal to discuss at COLTO AGM, including identifying mechanisms for leveraging funding for new research. The proposal to include details such as gear development required, data collection agreement, data delivery agreement and investigate particularly the concept of applying CTD data loggers on every set of longlines in toothfish fisheries from the start of next year onwards.**

   Nominees at the meeting were: Keith Reid (Chair), Trond-Inge Kvernevik, Andy Smith, Richard Ball, Dirk Welsford, Rohan Currey, Steve Parker, Chris Darby

The meeting closed at 1 pm on Friday 26 July.

## List of Attendees

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