

REPORT OF WORKING GROUP 24 ON *ENVIRONMENTAL INTERACTIONS OF MARINE AQUACULTURE*

The Working Group on *Environmental Interactions of Marine Aquaculture* (hereafter WG 24) held its inaugural meeting from 9:00–12:00 h on October 25, 2009, under the co-chairmanship of Mr. Kevin Amos, Dr. Katsuyuki Obo and Dr. Stewart Johnson (for Ms. Ingrid Burgetz). A list of participants and the meeting's agenda can be found in *WG 24 Endnotes 1* and *2*.

AGENDA ITEM 4

Review of Terms of Reference and reports by activity

Review of Terms of Reference

Dr. Abo provided a brief review of the Terms of Reference (TOR) for WG 24. Working Group members were asked to review them to ensure that they are relevant to all of the PICES member countries. Dr. Glen Jamieson mentioned that the FUTURE Advisory Panel on *Anthropogenic Influences on Coastal Ecosystems* (AICE-AP) will continue to examine and adjust the TOR over time. Dr. Steve Rumrill questioned whether the specific areas outlined in the TOR would be all explored by WG 24 in the future. There was a short discussion on this issue as well as the timing for addressing these specific areas.

Decision: All parties present agreed that the TOR are appropriate for the Working Group at this time. Specific issues to be addressed by the Working Group will be developed before the next Annual Meeting.

Reports of Activity Leaders

Prior to the meeting, PICES member countries were asked to provide information in the following areas as they relate to aquaculture:

- 1) species of interest and production methods,
- 2) risk assessment and
- 3) diseases of aquaculture including potential interactions between wild and farmed marine animals.

The responses received from member countries in response to questions for the three activity areas were reviewed by the Activity Leaders.

Activity 1: Species of interest and production methods (K. Abo)

Dr. Abo received responses from all countries for this activity, which were summarized and presented. During review of these data several areas requiring revision were identified. Dr. Abo will revise his summary to incorporate information provided during the meeting. He will then send this revised version to all Working Group members for a final review and comment.

Action: Dr. Abo will produce a finalized document that will be made available to all Working Group members. This document will provide definition for the various culture methods that are used.

Due to the diversity of species under culture in the various member countries, it was suggested by Dr. Stewart Johnson that the Group consider the use of functional groups rather than individual species. Dr. Jamieson noted that with respect to examining environmental impacts, then this may be a relevant way to proceed. Dr. Brett Dumbauld supported this view.

It was suggested using the information received for Activity 1 that three or four general themes suitable for more detailed study should be identified. Dr. Rumrill suggested that the Group should focus on helping producers understand interactions rather than focusing on differences in production techniques.

Activity 2: Risk Assessment (E. Black)

Dr. Edward Black reviewed the reference terms of relevance to Activity 2 and then provided a brief summary of the responses he received. The TOR were considered in their broadest sense. It was questioned if AICE-AP was most interested in “thresholds of resistance”. Dr. Jamieson stated that it was not the only component of risk analysis that the AICE-AP considers important.

Based on his experience, Dr. Black pointed out the long period of time that is required to develop and conduct risk assessments. He suggested that it will be difficult, if not impossible, to meet some of the TOR (especially the TOR #2) within the 3-year time frame of the Working Group. The great amount of information that was received from the member countries is an important first step in the process of risk assessment.

The Group discussed whether TOR #3 could be achieved. It was questioned whether the goal should be to standardize risk assessment methods or to understand the relationships between the different methods used within member countries. If the latter is the case then rewording of the TOR will be required.

There was further discussion on whether the groups should focus on risk assessment for single species, for a specific site or at the ecosystem level. Most responses to the questionnaire focused on studies of single species rather than specific sites or ecosystems.

Mr. Graham Gillespie asked, that since PICES has no official way of providing advice to national governments, whether standardization of risk assessment is a reasonable goal for the Group to try to achieve. He also noted the necessity to standardize terms within the Working Group. He suggested that the Group possibly compile a list of assessment methodologies used in the different countries.

Dr. Gary Wikfors questioned whether standardization of risk assessment methods between countries was possible. He briefly discussed the differences between intercalibration and standardization and suggested that intercalibration of methods should be the way that the Group should proceed. It was suggested that this could be achieved by supplying member countries with a data set that they would analyze using their respective methods/standards. The results of the different analyses then could be compared to understand differences between approaches.

Dr. Galina Gavrilova noted that participation in Activity 2 will be difficult for Russian participants as there is not a lot of aquaculture development or the legislation to support risk assessment activities in Russia.

Decision: WG 24 will not work towards standardization of risk assessment methods. Understanding the different methods used in the member countries and how these methods compare to each other is a more important goal.

Action Items:

- Dr. Black will produce a spreadsheet similar to Activity 1 to summarize the data that were received and circulate it to Working Group members.
- Dr. Black will confirm by email interest of Working Group members in Activity 2.
- Dr. Black will provide a list of risk analysis terms and their definitions to Working Group members, with the ultimate goal of working towards an agreement of which terms to use.
- WG 24 will work towards defining its focus with respect to scale (species, sites or ecosystems).

Activity 3: Report on aquatic animal health (K. Amos)

Mr. Amos reviewed the TOR for Activity 3 and provided a brief summary of the reports received from PICES member countries. In general, most member countries have a good understanding of diseases in cultured animals but limited information or research activities related to the understanding disease in wild populations. He noted that from the U.S. perspective, a major question was whether pathogens shed from aquaculture have

negative impacts on wild hosts and the ecosystem. He proposed that the Office International des Épizooties (OIE) guidelines related to aquatic animal health be used as a starting point for the Group. It was questioned whether all member countries subscribed to, or were members of, the OIE. Several group members were unfamiliar with the OIE. However, examination of the OIE website revealed that all member countries are part of the OIE. Dr. Abo noted that participation in the OIE was very important to Japan. He felt that the limited number of responses from Japan was, in part, due to scientists feeling that the information requested for Japan by the Working Group could be accessed through the OIE. Dr. Johnson noted that not all diseases are listed under the OIE and that there may important diseases WG 24 should consider which are not covered.

It was noted that PICES member countries have different interests with respect to diseases of concern and host species. Countries also vary widely in their research and diagnostic capacity, and the magnitude of disease monitoring in both cultured and wild populations. For example, Dr. Gavrilova stated that other than information on parasites of wild fish and bacterial pathogens of sea cucumbers, Russia has limited data on disease. This is in comparison to several other countries which have regional or national programs in Aquatic Animal Health. Dr. Johnson suggested taking a more ecosystem-based approach, possibly focusing on model pathogens for study. Mr. Gillespie suggested that the Group should consider following the earlier suggestion of studying functional groups (*e.g.*, specific types of pathogens such as gram negative bacteria) rather than specific species. There was also a suggestion that the WG 24 needed to better understand bilateral agreements between PICES member countries that are related to the Working Group's mandate. This would help to develop and refine the TOR.

Actions:

- Mr. Amos will forward the URL for the OIE website and confirm with members whether they agree that this is a good starting point for the Group.
- Mr. Amos will send a request to Working Group members to provide information on pathogens of concern that they feel would be suitable for study. These could be of concern for either farmed or wild hosts or both.

Ex-officio membership

Dr. Bychkov provided the group with information on membership within working groups. He noted that many issues facing the Pacific Ocean are not unique to the Pacific and the expertise of importance to PICES activities may be found outside of member countries. He explained *ex-officio* membership on committees and the procedures that need to be followed to bring in *ex-officio* members. As of April 2009 there will be an option to have *ex-officio* members from non-member countries or international organizations. He also mentioned that scientists from member countries can be asked to sit as observers by the working group.

AGENDA ITEM 5

Next Steps

Concern was expressed that there had not been sufficient time set aside for the first meeting of this Working Group. Following discussion of the length of time for the next Working Group meeting, the following was decided upon.

Decision: To request a 1½-day Working Group business meeting to be held in advance of the PICES 2010 Annual Meeting.

WG 24 also discussed the possibility and logistics of a field trip for members after the next Working Group business meeting.

Action: Co-chairs will examine the possibility of a field trip for the Working Group to be held before or after the next WG 24 meeting at PICES-2010. Sources of funding to support a field trip will have to be explored.

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AGENDA ITEM 6

Relationship with international organizations

WG 24 discussed possible relationships with ICES working groups. There was also some discussion of a possible of a joint meeting with ICES working groups to be held after the next world aquaculture meeting. Due to the short time frame it was decided that the group would not attempt to develop a joint meeting.

Action: Dr. Black (a member of ICES) will provide information on ICES activities related to Activity 2.

AGENDA ITEM 7

Proposal for a workshop/Topic Session at PICES-2010

The Group discussed the possibility of a workshop and/or session for the next PICES Annual Meeting in Portland, U.S.A., and felt that it was premature to propose a workshop or Topic Session.

AGENDA ITEM 8

Other business

Following a series of discussions the following action items and decisions were agreed upon.

Actions:

- Dr. Johnson will circulate a copy of the minutes of the working group members for comments. Corrected minutes will be circulated to the working group members.
- Mr. Amos will send a reminder to all members responsible for action items within 2 weeks after the end of meeting.
- All members to provide extra information and comments via email to the activity leaders (as soon as possible) but welcome throughout the year.

Decision: WG 24 agreed to support a workshop entitled “*Economic relation between marine aquaculture and wild capture fisheries*” at PICES-2010.

WG 24 Endnote 1

WG 24 participation list

Members

Katsuyuki Abo (Japan, Co-Chairman)
Kevin Amos (U.S.A., Co-Chairman)
Edward Black (Canada)
Brett Dumbauld (U.S.A.)
Galina Gavrilova (Russia)
Graham Gillespie (Canada)
Toyomitsu Horii (Japan)
Stewart Johnson (Canada, representing
Co-Chairman, Ingrid Burgetz)
Hyun-Jeong Lim (Korea)
Tamiji Yamamoto (Japan)
Xuelel Zhang (China)

Observers

Alexander Bychkov (PICES)
Ik-Kyo Chung (Korea)
Glen Jamieson (Canada, Chairman MEQ)
Steve Rumrill (U.S.A.)
Mikhail Stepanenko (Russia)
Gary Wikfors (U.S.A.)

WG 24 Endnote 2

WG 24 meeting agenda

1. Welcome by WG 24 Co-Chairs (K. Abo, K. Amos, E. Black and S. Johnson – for Ingrid Burgetz)
2. Introductions by WG 24 members
3. Approval or edits to the agenda
4. Review of terms of reference and reports by activity leaders
 - a) Activity 1 – report by Katsuyuki Abo
 - b) Activity 2 – report by Edward Black
 - c) Activity 3 – report by Kevin Amos
5. Discussion on next steps for each activity
6. Discussion on coordination of potential activities with ICES
7. Proposal for a workshop/Topic Session at PICES-2010 in Portland, Oregon
8. Other work group business
9. Adjourn at 12:00 pm

Afternoon – Field trip to aquaculture facilities hosted by Dr. Hyun-Jeong Lim