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# COMMITTEE ON FISHERIES

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### BIODIVERSITY MAINSTREAMING IN CAPTURE FISHERIES AND AQUACULTURE

#### Executive Summary

This information paper provides background information on FAO's approach for mainstreaming of biodiversity within and across sectors, in particular in capture fisheries and aquaculture.

## I. INTRODUCTION

1. The use of the term biodiversity in fisheries broadens the sector's perspective beyond targeted species, so as to include all parts of nature including components not intentionally harvested and those providing regulating and supporting ecosystem services. Mainstreaming biodiversity considerations in capture fisheries and aquaculture has a long history, formally beginning in the 1980s, when definitions of what was needed for sustainable development were worked on by the World Commission on Environment and Development,<sup>1</sup> and under Agenda 21 of the United Nations Conference on Environment and Development (UNCED)<sup>2</sup> that increased awareness and demand for conservation of biodiversity.
2. The adoption of the binding UN treaty, the 1982 Law of the Sea Convention holds instructions on "protection of the marine environment", including provisions for both target species in fisheries and associated and dependent species, that together are key parts of marine biodiversity.
3. This increasing demand for conservation of biodiversity resulted in the Convention on Biodiversity (CBD) coming into force in 1993. The CBD and its Members (Parties)<sup>3</sup> strengthened the policy framework and implementation capacity for i) the conservation of biological diversity (or biodiversity); ii) the sustainable use of its components; and iii) the fair and equitable sharing of benefits arising from genetic resources.
4. FAO increased its focus on the environmental goals for sustainable fishery development, with adoption of the seminal 1995 Code of Conduct for Responsible Fisheries<sup>4</sup>, and in 2001 through the Reykjavik Declaration<sup>5</sup> which laid the foundations for a broad 'Ecosystem Approach to Fisheries' (EAF). The EAF built on past fisheries management paradigms, amalgamating the emerging paradigm of ecosystem-based management with conventional fisheries management.
5. To promote consideration of biodiversity, at its tenth meeting in 2010, the Conference of the Parties (CoP) to the CBD adopted the Strategic Plan for Biodiversity 2011-2020, along with time-bound biodiversity targets collectively known as the 'Aichi Biodiversity Targets'. Several of these targets are of relevance to fisheries and aquaculture, although the components of Target 6<sup>6</sup> spell out most completely the standards that the Parties to the CBD expect of fisheries.
6. The thirteenth CBD CoP, held in 2016 in Cancun, Mexico, highlighted the importance of achieving the Aichi Biodiversity Targets and the Sustainable Development Goals. Biodiversity mainstreaming within and across agriculture, forestry, fisheries and tourism was a particular focus of this meeting; the high-level segment adopted the "Cancun Declaration on Mainstreaming the Conservation and Sustainable Use of Biodiversity for Well-being".<sup>7</sup>

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<sup>1</sup> Brundtland Commission 1983-1987.

<sup>2</sup> 1992 UNCED and its Agenda 21. <http://www.un.org/geninfo/bp/enviro.html>.

<sup>3</sup> CBD currently has 196 Parties.

<sup>4</sup> FAO. 1995. Code of Conduct for Responsible Fisheries. Rome. 41 p. ISBN 92-5-103834-5.

<sup>5</sup> FAO. 2003. Appendix 2: The Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem, 409-411. In Sinclair, M. and G. Valdimarsson. Responsible fisheries in the marine ecosystem. Rome (Italy) and Wallingford (UK). FAO and CABI Publishing: 426 p.

<sup>6</sup> <https://www.cbd.int/sp/targets/rationale/target-6/>

Target 6: By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

<sup>7</sup> <https://www.cbd.int/cop/cop-13/hls/cancun%20declaration-en.pdf>.

7. While FAO and CBD do not yet have a formal agreement on cooperation in fisheries and aquaculture, they are part of a multi-agency Memorandum of Cooperation on the CBD Strategic Plan for Biodiversity 2011-2020 and the achievement of the Aichi Targets.<sup>8</sup>

8. The term ‘mainstreaming’ has a variety of definitions and interpretations across different sectors. For example, the Global Environmental Facility Scientific and Advisory Panel has defined mainstreaming as “the process of embedding biodiversity considerations into policies, strategies and practices of key public and private actors that impact or rely on biodiversity, so that it is conserved and sustainably and equitably used both locally and globally”<sup>9</sup>. The same document notes that mainstreaming is a long-term process, a social experiment in changing the value structures of institutions and individuals with vital consequences for the natural world and the humans who rely on it. Good governance and strong institutions are key determinants of success. For successful mainstreaming, it is important to start from the objectives and rationales of the sectors and policy arenas into which biodiversity and ecosystem services are to be mainstreamed.

9. FAO’s commitment to integrating biodiversity considerations within and across agriculture and its derivatives,<sup>10</sup> otherwise called mainstreaming, is reflected across the current Programme of Work and Budget. FAO launched a *Biodiversity Mainstreaming Platform* (Biodiversity Platform) to build bridges across sectors, in order to identify synergies, align goals and develop integrated cross-sectoral approaches to mainstreaming biodiversity in the agriculture, forestry and fisheries. The 40th FAO Conference welcomed FAO’s initiative to act as *Biodiversity Platform* and requested FAO to facilitate, in collaboration with its partners, the integration of biodiversity across sectors, at national, regional and international levels<sup>11</sup>.

10. In the 33rd session of COFI, CBD and biodiversity related matters are addressed under working documents related to Global and regional ocean processes (COFI/2018/8) and Climate change and other environment related matters (COFI/2018/10). This information document provides more expanded information on some of the challenges and opportunities for mainstreaming biodiversity within the fisheries and aquaculture sector and describes some of the interactions they have with other sectors, while presenting selected fields for suggested FAO action.

## II. CHALLENGES AND OPPORTUNITIES

11. Agriculture, including fisheries and aquaculture, crop and livestock production and forestry, depend heavily on biodiversity and its components, as well as on ecosystem functions and services. The maintenance of biodiverse natural systems is critical for the resilience and sustainability of these sectors, thereby sustaining food production and the provision of ecosystem functions and services that are vital to humanity. FAO recognizes that mainstreaming biodiversity across relevant policies, plans and programmes of fisheries and aquaculture is as essential for halting the loss of biodiversity and preserving ecosystem structure and function, as it is for improving food security and nutrition and achieving sustainable development of reliant communities.

12. FAO assists Members by providing biodiversity related inputs on fisheries and aquaculture into international processes that require them. Many international targets link to biodiversity, but from a fish resources perspective CBD’s Aichi Targets 6, 11 and 12, and Sustainable Development Goal

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<sup>8</sup> <https://www.cbd.int/doc/agreements/agmt-fao-5-27-2005-moc-web-en.pdf> and <https://www.cbd.int/doc/agreements/agmt-aichi2020-2011-09-20-moc-web-en.pdf>.

<sup>9</sup> Huntley, B.J. and Redford, K.H. (2014). ‘Mainstreaming biodiversity in Practice: a STAP advisory document’. Global Environment Facility, Washington, DC.

<sup>10</sup> Constitution, Article I.1.

<sup>11</sup> C 2017/REP, Paragraph 55.

14<sup>12</sup> of the 2030 Agenda for Sustainable Development are especially relevant in driving international responses.

13. Just as aquatic ecosystems play an important role in regulating climate, climate change is causing ecosystem perturbations that alters the biological diversity and structure and function of related environments. In regards, reporting into international climate change processes, FAO recognizes that both fisheries resources and aquaculture production are being affected by shifting trends in climate. FAO's work on understanding and helping Members in adapting to these changes is further described in COFI/2018/Inf.23.

14. FAO collates data on production from fishing and aquaculture, and information on aquatic species otherwise impacted by these activities. FAO recurrently reports on this data, using FStatJ<sup>13</sup>, FIGIS<sup>14</sup> and FIRMS<sup>15</sup>, as well as summaries of trends in this data to communicate how shifts in human pressures are impacting living resources.<sup>16</sup> These products, which describe change in what is an important part of aquatic biodiversity, indicate that 68.5 percent of assessed commercial fish stocks are fished within biologically sustainable levels in 2013, down from 90% in 1974<sup>17</sup>. Such data inform prioritisation of fisheries management work as well as EAF and Ecosystem Approach to Aquaculture delivery, all important for mainstreaming biodiversity in these sectors.

15. The collection of species information from fisheries and aquaculture production contributes to the description of changes in the status of aquatic biodiversity. However, identification to species level has proved to be a long term challenge. FAO's FishFinder Programme (ex Species Identification and Data Program) supports FAO Members in this task, and is currently in a new and innovative stage of development, moving from traditional analogue to digital formats that harnesses machine learning, artificial intelligence (AI) and mobile technologies to help identify fish to species level from digital imagery.

16. FAO's activity related to threatened species management and conservation seeks to maintain the integrity of biodiversity, while supporting sustainable trade and livelihoods through cooperation with the Convention on International Trade in Endangered Species (CITES), the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the International Union for Conservation of Nature (IUCN), the Convention on Wetlands, the Convention concerning the Protection of the World Cultural and Natural Heritage and other MEAs. Elements of this work, which includes delivering scientific and technical information into the threatened species determination processes, production and distribution of communication materials on the status of commercially-exploited aquatic species and their management and support for Members in implementing recovery processes under the International Plan of Action model are described in COFI/2018/Inf.12. In 2018, FAO co-authored an analysis on the influence of management and trade interventions on threatened shark and ray species, in collaboration with experts from a range of national and international fisheries agencies.<sup>18</sup>

17. Besides overfishing, the fisheries sector is also confronted with other threats, ranging from water pollution and ecosystem degradation induced by the impact of human activities from other

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<sup>12</sup> <https://sustainabledevelopment.un.org/sdg14>

SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

<sup>13</sup> <http://www.fao.org/fishery/statistics/software/fishstatj/en>.

<sup>14</sup> Fisheries Global Information System.

<sup>15</sup> Fishery Resources Monitoring System.

<sup>16</sup> 'The State of World Fisheries and Aquaculture', <http://www.fao.org/fishery/sofia/en>

<sup>17</sup> SOFIA 2016

<sup>18</sup> <https://onlinelibrary.wiley.com/doi/pdf/10.1111/faf.12281>

sectors<sup>19</sup> such as oil drilling, energy installations, coastal development, establishment of dams and modification of river beds, and to climate change, within and beyond national jurisdiction.

18. FAO's activity related to marine and freshwater, the enabling environments for biodiversity, includes providing expert scientific and technical input into international management and conservation processes. Examples of this include i) the Biodiversity Beyond National Jurisdiction process, where negotiations over high seas - deep seas policy development is in progress ii) Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA) and 2014 FAO Voluntary Guidelines for Flag State Performance; iii) the CBD Subsidiary Body on Scientific, Technical and Technological Advice, where the Ecologically or Biologically Significant Marine Areas process is being considered. FAO maintains a Database on vulnerable marine ecosystems (VME),<sup>20</sup> and is also working to mitigate habitat impacts from fishing gears where this occurs.<sup>21</sup> In 2017, FAO co-authored a global analysis of depletion and recovery of seabed biota after bottom trawling disturbance, in collaboration with authors from a range of academic and national research institutions, and national and international fisheries agencies.<sup>22</sup>

19. FAO provides scientific and technical expertise on spatial management of fisheries and aquaculture, including on marine protected areas (MPAs) into international processes. In 2017, FAO published a report on MPAs and their interactions with fishery livelihoods and food security,<sup>23</sup> while in February 2018, FAO participated in the CBD's Expert Workshop on MPAs and Other Effective Area-Based Conservation Measures (OECMs) for achieving Aichi Biodiversity Target 11 in Marine and Coastal Areas. The new draft definition of OECMs developed at this meeting offers a good opportunity for the contributions of a wide range of sectors, including fisheries and aquaculture, to get recognition for their biodiversity conservation efforts.<sup>24</sup>

20. FAO's activity related to reducing unwanted interactions with threatened species and in limiting waste and bycatch (also see COFI/2018/Inf.26) centres on FAO's International Guidelines on Bycatch Management and Reduction of Discards,<sup>25</sup> and promotion of complete utilization of catches. These approaches also look at means and methods for reducing marine mammal mortality in fishing and aquaculture operations (also see COFI/2018/SBD.19).

21. In further limiting the unintended impacts of fisheries and aquaculture on biodiversity, FAO works on abandoned, lost or otherwise discarded fishing gear in the oceans (see COFI/2018/Inf.24), which includes the development of international processes for the marking of fishing gear (see COFI/2018/SBD.17, 18 and 19). FAO also has work underway on plastic and micro-nano plastics in the ocean, in 2017 publishing a report on microplastics in fisheries and aquaculture that included understanding of the status of knowledge on the occurrence and implications for plastic pollution on aquatic organisms and food safety.<sup>26</sup>

22. Aquaculture production has grown substantially over the past decades and is nearly at par with capture fisheries.<sup>27</sup> The significant development of aquaculture raises questions about its environmental impacts on land, water and biodiversity; for example, aquaculture, especially shrimp farming, is reported to account for a large part of mangrove loss globally, or the risk of species

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<sup>19</sup> HLPE, 2014. Sustainable fisheries and aquaculture for food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2014.

<sup>20</sup> <http://www.fao.org/in-action/vulnerable-marine-ecosystems/en/>

<sup>21</sup> <http://www.fao.org/3/a-y5594e.pdf>, <http://www.fao.org/docrep/010/a1466e/a1466e00.htm>

<sup>22</sup> <https://doi.org/10.1073/pnas.1618858114>

<sup>23</sup> <http://www.fao.org/3/a-i6742e.pdf>

<sup>24</sup> Reference document for the OECM definition

<sup>25</sup> <http://www.fao.org/docrep/015/ba0022t/ba0022t00.pdf>

<sup>26</sup> <http://www.fao.org/3/a-i7677e.pdf>, <http://www.fao.org/in-action/globefish/fishery-information/resource-detail/en/c/1046435/>

<sup>27</sup> SOFIA 2016

invasion through brood stock exchange. On the other hand, aquaculture itself has to face competition from other users of land and water, but also offers opportunities for integration, for example with agriculture.

23. The Ad Hoc Intergovernmental Technical Working on Aquatic Genetic Resources for Food and Agriculture is a subsidiary body of the Commission on Genetic Resources for Food and Agriculture which reviews matters relating to policy and practice in the area of genetic resources of relevance to food and agriculture, including their conservation and sustainable use and the fair and equitable sharing of benefits derived from their utilization. A revised draft The State of the World's Aquatic Genetic Resources for Food and Agriculture report is available for review by the Committee (see document COFI/2018/SBD.7). Also the forthcoming The State of the World's Biodiversity for Food and Agriculture<sup>28</sup> provides information on aquatic species, their management, and the ecosystems provided by biodiversity.

24. FAO has been raising awareness on biodiversity mainstreaming in fisheries. At the CBD CoP in Cancun Mexico, the Executive Secretary of the CBD invited FAO to compile, in collaboration with CBD, experiences in mainstreaming biodiversity in fisheries, including through the ecosystem approach to fisheries, and make this compilation available prior to the CBD's fourteenth CoP. To respond, FAO staff, working in collaboration with staff from IUCN's Fisheries Expert Group (IUCN FEG), published an article in the journal *Marine Policy* entitled, *Mainstreaming Biodiversity in Fisheries*.<sup>29</sup>

### III. CONCLUSION AND WAY FORWARD

25. There has been a long history, and progressive improvement, in how biodiversity considerations are mainstreamed into fisheries. Global attention on delivery of mainstreaming, against internationally agreed CBD targets, will be elevated in the lead up to 2020. Considering the above, FAO will continue to support Member actions across biodiversity related interventions presented in this paper. The Committee may wish to consider the above programme of work with a view to offering advice to guide the emphasis of ongoing delivery of biodiversity mainstreaming, in order to ensure that further promotion of integration of biodiversity considerations within the fisheries and aquaculture sectors is well targeted and interaction with other sectors is strengthened.

26. FAO's initiative to act as Biodiversity Mainstreaming Platform across agriculture, forestry and fisheries offers an opportunity to help mainstream biodiversity in the fisheries and aquaculture sectors. The *Platform* has the potential to provide a useful mechanism to i) characterize sectoral pressures on the diversity of life and related ecological processes, and to ii) identify cross-sectoral mechanisms to reduce ongoing pressures, for example pressures that span the land-water divide, including the definition of objectives and quantitative targets against which progress could be monitored.

Discussions during the first activity of the Platform, a "Multi-stakeholder Dialogue on Biodiversity Mainstreaming across Agricultural Sectors"<sup>30</sup>, held at FAO headquarters from 29-31 May 2018, emphasized that the Platform should explore a systematic approach with the Rio Conventions, reinforce synergies and use the SDGs to develop links and join implementation goals. The meeting also suggested that FAO prepare a Biodiversity Strategy by 2020 to improve mainstreaming biodiversity across FAO's work for consideration by its technical committees and governing bodies. It stressed the need for the Platform to develop metrics, indicators and data to measure the impact and performance of measures related to the sustainable use and conservation of biodiversity in agriculture,

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<sup>28</sup> [www.fao.org/nr/cgrfa/biodiversity/sowbfa/en/](http://www.fao.org/nr/cgrfa/biodiversity/sowbfa/en/).

<sup>29</sup> <https://doi.org/10.1016/j.marpol.2018.03.001>

<sup>30</sup> <http://www.fao.org/about/meetings/multi-stakeholder-dialogue-on-biodiversity/en/>

fishery and forestry. More details on the Dialogue is contained in document COFI/2018/SBD.20 on Biodiversity mainstreaming.

27. The CBD is developing a strategic vision beyond 2020 as a follow-up to the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets. Early collaboration between FAO and the CBD on this future strategic focus will offer an opportunity for better programmatic integration on issues related to mainstreaming of biodiversity, increasing the opportunity of joint strategic planning and delivery on issues of mutual interest.

28. Seascape approaches and spatial management tools (including but not limited to MPAs) represent good opportunities for biodiversity mainstreaming in the fisheries and aquaculture sectors. The dialogue on how fisheries and conservation tools are integrated has significantly increased over the last decade. There is a need to ensure FAO remains engaged in this dialogue to help represent the needs and opportunities offered by the fisheries and aquaculture sectors. To this end, participation in technical working groups and international conferences will be critical.