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TECHNICAL CONSULTATION ON SEA TURTLES CONSERVATION AND FISHERIES

Bangkok, Thailand, 29 November-2 December 2004

SEA TURTLE CONSERVATION CONCERNS AND FISHERIES MANAGEMENT CHALLENGES AND OPTIONS

Abstract

Sea turtle populations worldwide are impacted by various human activities. Coastal and high seas fisheries also affect sea turtles, but the extent is often hard to quantify. Largely based on the results of the FAO Expert Consultation on Interactions between Sea Turtles and Fisheries within an Ecosystem Context (Rome, 9-12 March 2004), and aiming to complement and update those results, this document presents an overview of sea turtle status, highlighting those areas and fisheries where fisheries impacts may be a relatively important source of sea turtle mortality. Fisheries management, socio-economic, and legal aspects and approaches to reducing sea turtle mortality are also considered.

I. THE CONTEXT

1. There are seven[1] species of sea turtles worldwide, distributed mainly in tropical and subtropical areas. Most species have a life span of almost 100 years and a life cycle that requires different types of habitat including sandy beaches, sea grass and algal beds, and the high seas. Because of their wide distribution range, both in terms of distance covered and types of habitat required, sea turtles interact with a wide range of human activities at all stages of their life cycle.

2. Sea turtles are impacted by a number of natural and man-induced factors, both in the terrestrial part of their habitat as well as in the marine environment. Impacts in the nesting environment, i.e. sandy beaches, include direct take of adults for meat, oil, shell etc., poaching of eggs, predation of eggs by feral animals, climate change affecting embryo development, loss of nests due to hurricanes, and heavy utilization

[1] These are the loggerhead turtle (*Caretta caretta*), hawksbill turtle (*Eretmochelys imbricata*), Kemp's ridley turtle (*Lepidochelys kempii*), olive ridley turtle (*Lepidochelys olivacea*), flatback turtle (*Natator depressus*), leatherback turtle (*Dermochelys coriacea*) and green sea turtle (*Chelonia mydas*). Some authors also recognize the black turtle of the Pacific coast of the Western Hemisphere (*Chelonia agassizi*) as a distinct species from *Chelonia mydas*, which brings the total number of sea turtle species to eight (FAO Fisheries Synopsis No. 125, Volume 11).

of nesting beaches by humans. In the marine environment, threats derive from pollution (sea turtles eat a wide variety of marine debris such as plastic bags, plastic and tar balls, balloons), boat collisions, particularly in waters near shore. Furthermore, sea turtles are caught in bottom trawls and gillnets and can become entangled in longlines, fish traps, buoy lines and other ropes.

3. Almost all sea turtles are now considered as threatened or endangered. The World Conservation Union (IUCN) lists three species of sea turtles as critically endangered (leatherbacks, Kemp's ridleys and hawksbills) and another three as endangered (greens, loggerheads and olive ridleys). The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) identifies all species (except the flatback turtle) as threatened with extinction, and lists them in Appendix I, which means any international trade in sea turtles or sea turtle products is prohibited.

4. Reliable data on sea turtle abundance and on the multiple sources of mortality (both man-induced and natural), necessary for stock assessment, are generally not available. In addition to the lack of data, there is a serious difficulty in putting together all the factors that might influence population abundance of sea turtles into a common framework because of their long and complex life histories. The status of most sea turtle stocks is therefore poorly known and documented, and most assessments are based on anecdotal or qualitative information.

5. There is, however, evidence that some sea turtle populations have sharply declined. As an example it is estimated that the number of nesting leatherback turtles in the Pacific Ocean has declined by over 95% during the past 20 years, and the number of nesting loggerheads has declined by about 80% during the same time period.

6. The expansion in fishing activities in coastal areas and in the high seas during the second half on the twentieth century is believed to have contributed to the declines of several sea turtle populations, both due to direct take of sea turtles and because of interactions with fisheries targeting other species. As regards the latter, focus has first been addressed to shallow-water shrimp fisheries, leading some nations to require the use of Turtle Excluder Devices (TEDs) in trawl gear. Attention has more recently been directed towards longline fisheries, particularly in the high seas fisheries for tuna and swordfish, and to other fisheries in coastal areas using gear such as longlines, gillnets, set nets and others.

7. The FAO Code of Conduct for Responsible Fisheries (CCRF), adopted in 1995, calls for a sustainable use of aquatic ecosystems and requires that fishing be conducted with due regard for the environment. The CCRF also addresses specifically biodiversity issues and conservation of endangered species and, in so doing, calls for the catch of non-target species, both fish and non-fish species, to be minimized. The CCRF also promotes the maintenance, safeguarding and conservation of biodiversity by minimizing fisheries impacts on non-target species and the ecosystem in general. The concept of a broader ecosystem approach to fisheries was reiterated and reinforced in the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem (2001).

8. Because of the concern on the status of sea turtles and the possible negative effects of fishing on these populations, the Twenty-fifth Session of the Committee on

Fisheries (COFI)[2] raised the question of sea turtles conservation and interactions with fishing operations and "agreed that while taking into consideration existing work on sea turtle interactions and conservation, a Technical Consultation..." should be held in Bangkok, Thailand, in 2004 to:

i. review the available information on the current status of sea turtle conservation including both incidental and direct catches, their impacts on the populations and other factors affecting the mortality of sea turtles;
ii. review the new development of fishing gears and techniques to reduce sea turtle mortality by incidental catches and other techniques to improve sea turtle conservation;
iii. produce, if appropriate, guidelines to reduce sea turtle mortality in fishing operations, and
iv. consider desirable assistance to Members of developing countries for the conservation of sea turtles.

9. The FAO Fisheries Department therefore started organizing this Technical Consultation and, as one of the first steps, convened an Expert Consultation on Interactions between Sea Turtles and Fisheries within an Ecosystem Context, held at FAO (Rome), 9 to 12 March 2004 (hereafter called "the Expert Consultation") to analyse the matter and prepare the required background documents for consideration by the Technical Consultation. This document summarizes and supplements the information and results presented in the report of the FAO Expert Consultation[3], by highlighting those aspects and suggested activities that, in the view of the FAO Secretariat, deserve special attention by this Technical Consultation.

II. INTERACTIONS BETWEEN SEA TURTLES AND FISHERIES

10. Sea turtles are widely distributed species. Five of the seven sea turtle species have a circumglobal distribution, and for each species there are several populations. Most populations have a distribution that includes shallow coastal, offshore waters and the high seas, according to their life stages. Therefore, interactions with fisheries may take place both within coastal and high seas fishing areas.

11. The Expert Consultation identified geographical areas where there is a higher likelihood that interactions between sea turtles and fisheries could have a high negative impact on sea turtle populations. These are briefly summarized below, by coastal and high seas areas, respectively.

A. Sea turtles and fisheries in coastal areas

12. Fisheries in coastal areas may impact on females migrating for nesting, on juveniles, subadults and breeding adults. Trawls, gillnets, pelagic longlines and set nets can potentially catch sea turtles when used in areas of sea turtle occurrence.

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[2]FAO. Report of the twenty-fifth session of the Committee on Fisheries. Rome, 24–28 February 2003. FAO Fisheries Report. No. 702. Rome, FAO. 2003. 88p. Also available in electronic form online from: ftp://ftp.fao.org/docrep/fao/006/y5025e/Y5025E00.pdf

[3] FAO. Report of the Expert Consultation on Interactions between Sea Turtles and Fisheries within an Ecosystem Context. Rome, Italy, 9-12 March 2004. FAO Fisheries Report. No. 738. Rome, FAO. 2004. 37 p. Also available in electronic form online from: ftp://ftp.fao.org/docrep/fao/007/y5477e/y5477e00.pdf

13. The Expert Consultation drew attention to those sea turtle stocks that may be seriously impacted by fishing and therefore require urgent attention. The priority stocks are:
    - Pacific loggerhead
    - Pacific leatherback
    - Eastern Indian coast olive ridley

14. In order to significantly reduce the impact of fisheries in coastal areas on these most threatened sea turtle stocks, it is recommended that attention be focused on possible fisheries management options in the following fisheries and regions:
    - Coastal trawl fisheries off Southeast Asia
    - Coastal gillnet fisheries off Southeast Asia
    - Coastal gillnet fisheries in south Asian waters
    - Coastal trawl fisheries in south Asian waters
    - Coastal gillnet fisheries in southeast Pacific waters
    - Coastal gillnet fisheries in Baja California
    - Pelagic longline fisheries in Eastern Pacific waters

15. Relevant national fisheries management institutions and Regional Fisheries Bodies (RFBs) in these areas should consider paying urgent attention to the issue of interactions between fisheries and sea turtles. Attention could include the collection of statistics on bycatch in various coastal fisheries, as well as information on location of nesting beaches and foraging grounds, time of migration and occurrence in foraging grounds. This information will be needed if countries and regions are to develop possible management plans to reduce or prevent interactions with fishing operations (see also Section III below).

16. Furthermore, there are regions and fisheries where information is largely not available and the Expert Consultation recommended that basic information be urgently collected for:
    - Coastal trawl and gillnet fisheries in the Western Indian Ocean
    - Coastal fisheries in the Eastern Mediterranean
    - Coastal and offshore fisheries off the Eastern Central Atlantic

B. Sea turtles and high seas fisheries

17. Recently, much attention has been focused on the possible impact of high seas fisheries, particularly pelagic longline fisheries, on sea turtle populations. Main species targeted in these fisheries causing concern include the swordfish (*Xiphias gladius*) and various tuna species of the genus *Thunnus*. These fish species have a global distribution, from temperate to tropical regions, and their distribution overlaps with migration routes and foraging grounds of several sea turtle species.

18. Sea turtle bycatch in longlines results from sea turtles attempting to swallow bait or becoming entangled in gear. Longlines are set at different depths according to the species and size of fish being targeted. Large tunas are usually found in deeper waters (300-400 m) or associated with cooler water masses. Swordfish and smaller tunas are instead usually found in waters less than 100 m. There is evidence that sea turtles, in their pelagic phase, are largely confined to the upper 100 m. Use of mitigation measures is therefore most urgent for those longline fisheries that take place in relatively shallow waters (less than 100 m in depth), at time and seasons when and areas where sea turtles occur.

19. The Expert Consultation identified the following sea turtle stocks for which interactions with longline fisheries are believed to pose a major threat:
    - North and South Pacific loggerhead
    - Eastern Pacific leatherback
    - Mediterranean Sea loggerheads and green stocks

20. Further to the report of the Expert Consultation, it should be noted that:
    - North Pacific loggerheads that originate in Japan migrate throughout the North Pacific, mainly between 28 and 40˚N;
    - Western Pacific leatherbacks that originate in Australia, China, Fiji, Papua New Guinea, Solomon Islands, Thailand, and Vanuatu, and use the North Pacific for growing and foraging;
    - leatherbacks originating in the Eastern Pacific move to the South Pacific for foraging and growing, and
    - in the Mediterranean Sea, loggerheads are impacted by longline fisheries and by pelagic driftnets, mainly in the central and western parts of the Mediterranean basin.

21. Consideration should be given to implementing appropriate management measures to mitigate the impact on Pacific leatherbacks and loggerheads and Mediterranean loggerheads of longline fisheries targeting tuna or swordfish in waters less than 100 m deep.

III. APPROACHES TO REDUCING SEA TURTLE MORTALITY

A. Fisheries management measures for reducing sea turtle mortality

22. There are various fisheries management measures that can be used to reduce bycatch of sea turtles. These include technical measures (such as gear modifications, spatial and temporal control of fishing operations); regulations such as input (effort) and output (catch) controls; capacity controls; and post-capture procedures that can be adopted to ensure the release of live sea turtles from fishing gear.

23. Different types of measures may be appropriate to fisheries in coastal waters as compared to those in the high seas.

(1) Technical Measures for fisheries in coastal areas

24. Fisheries using bottom trawls in coastal and other near-shore areas and, particularly, coastal shrimp fisheries, may have a high impact on sea turtles. Considerable research has been conducted on gear modifications to reduce bycatch and resulted in the development of Turtle Excluder Devices (TEDs), initially by the USA, later also by other countries including India, Mexico, Australia, Japan and Thailand. The use of TEDs became compulsory in 1989 in the USA and has subsequently been introduced in a number of developing and developed countries.

25. Considerable experience exists in the introduction and implementation of TEDs and consideration should be given to the possibility of encouraging its implementation in all bottom trawl shrimp fisheries where significant interactions with endangered sea turtles are known to occur.

26. Other types of gear used in coastal areas that are known to catch or entangle sea turtles include longlines, set nets and gillnets, but there is a serious data deficiency on sea turtle interactions with these types of gear. Thus, there is a need to implement reliable data collection on fisheries/sea turtle interactions and other sources of mortality so that informed management decisions can be made to the benefit of both fishers and the sea turtle populations involved.

27. Temporal closures such as during nesting or migrating seasons or spatial closures of migratory routes, foraging grounds or nesting areas can also be implemented as complementary techniques to prevent sea turtle mortality.

(2) Technical measures for high seas fisheries (longlines)

28. Mitigation measures that have proven to be useful in reducing sea turtle bycatch in longline gear include the use of circle hooks, combined with specific types of bait, depth at which longline gear is set, length of branch lines, and configuration of line settings. Based on the preliminary results obtained through a research effort by the US National Oceanographic and Atmospheric Administration (NOAA) in the Northeast Atlantic, the Expert Consultation identified the use of circle hooks in pelagic longlining as having clearly demonstrated advantages justifying their implementation.

29. Since the Expert Consultation, the analyses by NOAA were extended to include wanted and unwanted bycatch species (tuna, sharks and sea turtles), their reaction to different parameters such as bait type, dyed bait, hook size, daylight and moon phase, and to different configurations of longlines. Research has also been conducted in the Gulf of Mexico longline fishery for yellowfin tuna to test different sizes of circle hooks and their respective catch efficiency on the target species[4]. Mexico and Japan have just concluded trials that include different hooks, bait and longline geometry. The main results of experiments carried out so far can be summarized as follows:

- The use of circle hooks appear to significantly reduce catches of sea turtles as compared to J-hooks. They also reduce swordfish catches but may increase catches of bigeye tuna and bluefin tuna.
- Mackerel bait catches fewer sea turtles (fewer loggerheads, in particular) and blue shark, and more swordfish, as compared to squid bait. Mackerel bait highly reduces the catch of bigeye tuna.
- When longlining for swordfish, 97% of swordfish - hook interactions happen at night between sunset and sunrise, and swordfish feeding activity is highest when the moon is above the horizon.
- Leatherback interactions with longlines also occur primarily when the moon is above the horizon.

30. It should be noted, however, that results of experiments carried out in a given region are not necessarily directly applicable to other regions. It is therefore strongly

[4] Based on these results, new technical measures have been introduced into the legislation for the US longline fisheries. As an example for the Pacific see : Federal Register: 2 April 2004, Volume 69, Number 64, Rules and Regulations, Page 17329-17354, and for the Atlantic: Federal Register: 6 July 2004, Volume 69, Number 128, Rules and Regulations, Page 40733-40758 (http://www.gpoaccess.gov/fr/index.html)

recommended that experiments are performed in each of the regions where interactions occur before implementing gear-related management measures.

31. Consideration should be given to the adoption of post-capture procedures to ensure the release of live sea turtles from fishing gear on pelagic longline vessels operating in areas where sea turtle bycatch occurs. It is recommended that fishermen are trained in this respect and that appropriate sea turtle release equipment is available on these vessels.

32. Experience shows that development, dissemination and implementation of new technology standards best work when these take place in close cooperation with fishermen and the fishing industry. It is therefore recommended that new experiments or initiatives aimed at introducing technical measures to mitigate sea turtle mortality take place in close cooperation with fishermen and the fishing industry.

33. Given that, in addition to sea turtles, several vulnerable species (such as sharks, sea birds and marine mammals) are taken in longline fisheries, it is advisable that the adoption of management measures directed to reduce interaction with these vulnerable species, takes place in an integrated manner.

(3) Initiatives for encouraging mitigation activities

34. The Expert Consultation recognized that the lack of incentive-aligning strategies was a major obstacle to implementing effective sea turtle conservation strategies.

35. Initiatives aimed at improving the institutional environment so that it supports efforts to mitigate the impacts of fisheries on sea turtles should be considered. These could include, for example:
    - Supporting fishermen-based proposals for new gear configurations and other potential management measures to create win-win solutions, e.g. through contests and festivals to celebrate advances and accomplishments in mitigating the impacts of fisheries on sea turtles.
    - Promoting fishing gear use and practices compatible with turtle conservation and management objectives, as to minimize dislocation of fishing communities and disruption of their fishing activities.
    - Training and awareness-building programmes for fishers to better tackle the problems of sea turtle mortality arising from fishing activities, especially aiming at better and more effective use of fishing gear to reduce marine turtle mortality.
    - Considering mechanisms to compensate fishers for lost fishing opportunities as a result of turtle conservation and management measures. These mechanisms could include free training for fishers to effectively move to and participate in fisheries that have minimal interactions with turtles, and to provide for alternative employment if fishers would have to leave fishing for other occupations as a result of turtle conservation measures.

36. Initiatives should be considered that help fishermen:
    - To develop collective values for sea turtle conservation through education, information and training about the benefits of sea turtle conservation and to use technologies to minimize or mitigate the incidental catch of sea turtles.

- To consider establishing market-based incentives (e.g. ecolabelling) which can potentially provide price premiums and/or open up new market niches for "turtle friendly" products.

37. Conservation initiatives to offset sea turtle mortality due to fishing should be considered where possible/desirable, such as nesting habitat protection, conservation, or restoration.

38. It is important that the institutional framework for fisheries management and sea turtle conservation is structured in a way that policy coordination across the various conservation and fisheries agencies and authorities is ensured.

39. In addition, the Expert Consultation recognized the importance of other initiatives that have addressed the issue of sea turtle conservation, including reducing interactions with fisheries. The Bellagio Blueprint for Action on Pacific Sea Turtles[5] is such an example, providing guidelines for an integrated approach to Pacific sea turtle conservation and constructive technical and policy suggestions on how interactions with fisheries may be reduced.

B. Socio-economic considerations for sea turtle mortality management activities

40. It is important to take into consideration the social and economic importance of fisheries to coastal communities and to national economies and to be sure to complement biological information with socio-economic information.

41. The Expert Consultation recommended that:
    - …sea turtle conservation and management programmes should recognize the important contributions of fisheries to employment, income and food security and should be effectively integrated into fisheries management programmes.
    - The development, design, and implementation of turtle conservation and management measures should take into account the socio-economic aspects of fishers and fishing communities. These communities are dependent on marine fishery resources for their life and livelihood, and balance should be sought between the conservation and management of sea turtles on the one hand, and sustainable livelihoods and poverty alleviation, on the other.

42. The Expert Consultation also recommended that:
    - Sea turtle conservation and management programmes should encourage active participation of fishers, fishing communities and other stakeholders in sea turtle conservation programmes including nesting beach protection and fisheries programmes, and should also build upon the existing traditional ecological knowledge systems.

43. In recognition of the importance of socio-economic factors to the success of the implementation of any conservation and management measures, the Expert Consultation further recommended the collection of:
    - ...reliable socio-economic baseline and trends data on fisheries and fishing communities to monitor the socio-economic impacts of turtle conservation and management measures;

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[5] Steering Committee, Bellagio Conference on Sea Turtles. 2004. What can be done to restore Pacific turtle populations? The Bellagio Blueprint for Action on Pacific Sea Turtles. World Fish Center Contribution No. 1726. 24 p. Also available in electronic form online from:
http://www.worldfishcenter.org/Pubs/bellagio-blueprint/bellagio-blueprint.htm

and in support of this:

- ...the development of biological and socio-economic indicators.

IV. LEGAL ASPECTS

44. There is no global legal instrument dealing specifically with the protection of marine turtles in a fisheries context. The 1982 Convention on the Law of the Sea and the 1992 Agenda 21 address the objective of limiting bycatches of non-target species in fishing operations, although the application of specific methods is not required. The UN Fish Stocks Agreement requires States to minimize catch of non-target species, in particular endangered species, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost-effective fishing gear and techniques.

45. In the same spirit, the FAO Code of Conduct for Responsible Fisheries (CCRF) provides for a broad range of guidelines for Governments and those involved in fisheries activities with the aim to promoting responsible fisheries. Some of the provisions of the CCRF promote, *inter alia*, the further development and application of selective and environmentally safe fishing gear and practices in order to maintain biodiversity and to conserve the population structure and aquatic ecosystems. The wording of these instruments is quite broad, and there is a need to tackle the issue of sea turtle bycatch and exploitation in a more specific manner.

46. Given the far reaching migratory patterns of sea turtles and the fact that they often occur within the exclusive economic zones of two or more coastal countries as well as in the high seas, international cooperation is fundamental to achieve the objectives of conservation and sustainable use of sea turtles. Therefore there is a need for countries to cooperate for the purpose of adopting comparable measures with respect to the management and conservation of sea turtles.

47. A few regional instruments[6] have recognized the use of selective fishing gear, including TEDs, and environmentally safe fishing techniques as important tools for the conservation and protection of threatened and endangered species, including sea turtles. Specific attention has been given to the issue of bycatch of sea turtles by trawlers. Initially, less consideration was given to other fishing methods that may adversely impact upon sea turtles. More recently, a number of Regional Fisheries Bodies (RFBs), in particular those dealing with tuna and tuna-like species, have adopted resolutions with a view to addressing the adverse effects of tuna fishing on populations of sea turtles[7].

48. The mandate of RFBs is usually to cooperate in maintaining populations of exploited species at sustainable levels. As ecosystem considerations are a relatively new concern, there are few instances where RFBs' mandates make explicit reference[8] to the conservation of non-target species occurring in the same ecosystem.

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[6] To cite a few: The Inter-American Convention for the Protection and Conservation of Sea Turtles, 1996 (*not yet in force);* Southeast Asian Fisheries Development Center (SEAFDEC); the Memorandum of Understanding on the Conservation Measures for Marine Turtles of the Atlantic Coast of Africa, 1999.

[7] For example, the Inter-American Tropical Tuna Commission (IATTC) and the International Commission for the Conservation of Atlantic Tuna (ICCAT).

[8] Such an example is the Antigua Convention in the Eastern Pacific Ocean.

49. Member States could consider revising the mandate of relevant RFBs, as those dealing with the management and conservation of tuna and tuna-like species, to allow them to adopt specific measures more consistent with the wider scope of fisheries management as outlined in the FAO CCRF and in the FAO Guidelines on Ecosystem Approaches to Fisheries Management[9]. The scope of these bodies should thus be broadened to cover issues relating to the sustainability of vulnerable bycatch species.

50. There has been significant change in national legislation governing sea turtles according to a review conducted by the Legal Office of FAO. In the mid-1960s concerns were primarily related to aspects of exploitation of sea turtles and were dealt with under old hunting and fishing laws, while current aims are related to promoting integrated conservation and management. These changes were driven by developments in international law and by initiatives in a number of countries.

51. There is a considerable variation in national legislation and thus, different practices in the respective countries. This variation is reflected at the level of the nature and contents of conservation and management measures, as well as by the variety of laws and regulations (hunting, environment, fishing, habitat, endangered species, biodiversity, trade, etc.) under which turtles are regulated. In some countries approaches are fragmentary and patchy, whilst in others they are holistic and harmonious. Countries should work at the national level to integrate their various pieces of legislation dealing with these species in order to achieve their desired level of environmental objectives for sea turtle conservation and management.

52. The number and breadth of existing national laws and regulations reflect the broad concerns for the plight of endangered species and the awareness of the need to exploit resources sustainably. The great variety of laws and lack of harmony creates complex situations at national as well as international levels, hence there is a need for harmonization of sea turtle conservation legislation. Furthermore, sea turtle conservation and protection should be addressed in a larger context given the migratory and transboundary nature of sea turtles. International cooperation at regional and global levels is essential for creating a broad policy framework to shape and coordinate national measures.

V. DEVELOPMENT OF GUIDELINES TO REDUCE SEA TURTLE MORTALITY

53. Guidelines to encourage the use of mitigation measures to reduce mortality of sea turtles due to fisheries have been developed by various agencies and organizations. Some of the guidelines address how to avoid capturing sea turtles and how to release captured sea turtles in longline fisheries. Other guidelines address how to

[9] Recently, two Tuna Fishery Bodies have adopted regulations/recommendations dealing with sea turtles, namely ICCAT and IATTC. These resolutions call for the collection of information on interactions of tuna fisheries with sea turtles, release of marine turtles incidentally captured, implementation of technical measures to reduce incidental catch, promote safe handling of turtles and collaboration with FAO. In addition, IATTC has adopted a three-year programme to mitigate the impact of tuna fishing on sea turtles. The Indian Ocean Tuna Commission (IOTC) and the newly created Western and Central Pacific Fisheries Commission (WCPFC, entered into force only on 19 June 2004) have not adopted any regulation regarding the impact of tuna fishing on sea turtles.

reduce sea turtle bycatch in shrimp fisheries and include information about the type, design, use and operation of TEDs.

54. The Expert Consultation recommended that:
    - FAO consolidates existing handling and release guidelines, and/or further develops or expands these guidelines as appropriate.
    - FAO explores the possibility of producing a set of guidelines based on the best current information and methods.

VI. ASSISTANCE TO MEMBERS OF DEVELOPING COUNTRIES FOR THE CONSERVATION OF SEA TURTLES

55. Many of the actions that are likely to be required to mitigate negative impacts of fisheries on sea turtles will incur costs, which could have substantial impacts on the livelihoods of fishers and others dependent on the fisheries sector. Furthermore, many developing countries do not have the capacity or the financial resources that will be required.

56. Although a number of bi- and multilateral initiatives are underway to facilitate the development and implementation of fishing practices to reduce sea turtle mortality due to fishing in developing countries[10], it is essential that these efforts are strengthened and as far as possible extended to include all countries in need of assistance to protect sea turtle populations and reduce fisheries/sea turtle interactions.

57. Taking note of Article 5 of the Code of Conduct for Responsible Fisheries, the Expert Consultation recommended to:
    - develop mechanisms to direct financial and technical support to developing countries, possibly through the establishment of international cooperative frameworks or [a] voluntary support fund or similar vehicle in RFBs, and
    - explore ways to develop cooperative programmes for [sea turtle] research and conservation activities, including for coastal, oceanic and key habitat areas.

VII. SUGGESTED ACTION BY THE TECHNICAL CONSULTATION

58. The Technical Consultation is invited to review the information provided in this document and in document TC:STCF/2004/2, and to advise on the recommendations to be forwarded to the forthcoming 26th session of the Committee on Fisheries in 2005, particularly as regards:
    - The use of mitigation measures in coastal areas (paragraphs 12-15 and 24-27 of this document).
    - The collection of data on sea turtle bycatch in fisheries in coastal areas (paragraph 16).
    - The use of mitigation measures in longline fisheries (paragraphs 17-21 and 28-33).
    - Initiatives for encouraging mitigation activities (paragraphs 34-39).

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[10] See, for example, the Summary of International Activities related to Reduction of Bycatch of Sea Turtles in Longline Fisheries (NMFS and NOAA) at the website:
http://www.nmfs.noaa.gov/by_catch/sea_turtle_longline_bycatch_reduction.pdf

or the Kyoto University of Japan SEASTAR 2000 project website:
http://bre.soc.i.kyoto-u.ac.jp/seastar2000/top_english.htm

- Socio-economic considerations related to reducing sea turtle mortality due to fishing (paragraphs 40-43).
- Revising RFBs respective mandates to clearly include ecosystem considerations (paragraph 49).
- Harmonization of national legislation relevant to sea turtles conservation (paragraphs 51 and 52).
- Consolidation and development of guidelines to reduce sea turtle mortality due to fisheries (paragraphs 54 and 55).
- Assistance to members of developing countries for the conservation of sea turtles (paragraphs 56-58).