Report of the Plenary Session of the Fourth Meeting of the Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific

Honolulu, Hawaii, USA
February 2–4, 2004

1) Opening

Dr. Jeffrey Polovina, Acting Director of the U.S. Pacific Islands Fisheries Science Center, NOAA Fisheries, opened the fourth meeting of the ISC Plenary and welcomed the participants. Going around the table, the heads of national delegation Members introduced themselves and others in their delegations. Participating observers were also invited to introduce themselves.

2) Opening Statement

Dr. Samuel Pooley, Acting Director of the U.S. Pacific Islands Regional Office, NOAA Fisheries, welcomed participants on behalf of the newly formed Pacific Islands Region as well as the Southwest Fisheries Science Center, with Center Director Dr. William Fox serving as the head of the U.S. delegation. He briefly described the splitting off of the Pacific Islands Region from the Southwest Region to better focus on the conservation and management issues of Pacific Island and central and western Pacific fishery resources. He noted the significance of the ISC regarding the science of tuna and tuna-like resources in the North Pacific and the successful meeting of working groups last week, with the first assessment of Pacific bluefin tuna, the first meeting of the Marlins Working Group, and work on fishery statistics and the ISC database. An updated assessment of swordfish was particularly timely with the U.S. intent of reopening the Hawaii swordfish fishery. Dr. Pooley noted three key issues facing the ISC: 1) the inclusion of the North Pacific Albacore Working Group into the ISC, particularly since the scientific output of the working group provides a robust foundation for monitoring the status of the albacore fishery; 2) finalizing rules of procedure; and 3) determining the relationship of the ISC with international fishery management bodies particularly regarding provision of scientific advice including the shortly to be established Western Central Pacific Fishery Commission and Inter-American Tropical Tuna Commission.

3) Selection of Chairman and Rapporteurs

By acclimation of Members, Dr. Polovina was selected as Chairman of this meeting of the ISC. The U.S. nominated Robert Skillman and Paul Crone as rapporteurs, and Japan did likewise with Miki Ogura and Koji Uosaki. They were also accepted by acclimation.

4) Adoption of Agenda (Appendix 1)

The following additions to the agenda were proposed, discussed and agreed to by the Members:

a) Assessments from the Standing Committee on Tuna and Billfish (SCTB) and Inter-American Tropical Tuna Commission (IATTC) to be added to the bigeye tuna, yellowfin tuna, and marlin reviews in agenda topic 6;
b) A summary of the assessments of the individual species reviewed in agenda topic 6, as new subparagraph 6g;
c) Proposal to establish an ISC Secretariat, as new topic 11;
d) Consider adjustment to the Working Groups, as new agenda topic 12.

The list of the working papers from the 4th ISC Plenary is given in Appendix 2, and the list of participants is attached in Appendix 3.

5) Delegation Reports of Fisheries Regarding Tuna and Tuna-like Species

Canada (ISC/04/Plenary/01)

The Canadian fishery for albacore in the North Pacific Ocean is a troll fishery that use tuna jigs. Canadian fishermen have been fishing albacore since the mid-1930s. The fishery started in the coastal waters off British Columbia (BC). It has now developed into four fleet types classified by fishing area: (1) BC coastal, (2) BC/U.S. coastal, (3) high seas North Pacific and (4) high seas South Pacific. The coastal fleets contain the majority of the vessels. Many of the smaller Canadian vessels have been following the tuna concentrations offshore, thus extending their traditional fishing range to include the high seas.

Starting in 1945, sales slip records were the source for Canadian catches of albacore. In 1995, Canada implemented a comprehensive database for collecting albacore fishery statistics. All Canadian vessels must carry logbooks while fishing for highly migratory species in any waters. Detailed analysis of a combination of sales slips, logbooks, phone-in and transshipment records is undertaken to report fisheries statistics for the Canadian albacore fishery.

The total estimated Canadian catch for 2002 was 4,996 metric tons (t), slightly higher than in 2001 (4,985 t). Most of the catch in 2002 was taken in United Nations Food and Agriculture (FAO) Area 67 (4,703 t). The average catch for 1995–2002 was 3,627 t. The total estimated effort of the Canadian albacore troll fleet in the North Pacific in 2002 was 8,263 fishing vessel days. The average effort for the period 1995–2002 was 7,453 fishing vessel days. Catch per unit of effort (CPUE) in 2002 for the Canadian fleet was 612 kg/vessel-day. The average CPUE for the period 1995–2002 was 487 kg per vessel day.

During the 2000 fishing season, Department of Fisheries and Oceans (DFO), in collaboration with the members of the British Columbia Tuna Fisherman's

Association (BCTFA), recorded fork lengths and body weights from 67 albacore. Lengths and weights were recorded from frozen fish at dockside from a sample stratified by length. From the sample of 67 fish a weight-length relationship was developed ($W(kg) = 0.0000595 \bullet L(cm)^{2.754}$).

Discussion: Regarding variability in fishing effort for albacore, the success of the salmon season has some effect on effort from year to year and successful completion and amendment of a treaty with the U.S. affected the effort trend in later years.

Mexico (ISC/04/Plenary/02)

The National Institute of Fisheries of Mexico (Instituto Nacional de la Pesca, INP) has conducted scientific research on marine resources for more than 40 years. Since 1992, the Programa Nacional de Aprovechamiento del Atun y Proteccion al Delfin (PNAAPD) has brought monitoring and studying the tuna purse seine and longline fleets to the effort. In 2002, the Mexican tuna fishery landed 164,000 t of yellowfin, bigeye, and skipjack tuna and 181,000 t in 2003. Yellowfin accounted for 94% of the total catch in 2002 and 90% in 2003. A collaborative observer program between the PNAAPD and the IATTC of the tuna fishery has 100% coverage. Since 1990, the taking of billfishes within a 50 nautical mile coastal zone has been reserved for sport fishing. A swordfish fishery occurs outside the restricted area, and PNAAPD observers monitor this fishery.

Discussion: Participants found the list of scientific papers quite useful for keeping up with research progress in Mexico.

Chinese-Taipei (ISC/04/Plenary/03)

Three types of tuna fisheries currently operate in the North Pacific, the distant water longline (DWLL), distant water purse seine (DWPS) and offshore longline (OSLL) fisheries. Total number of DWLL vessels operating in 2002 was about 140. The dominant species caught was albacore at about 58% of the total catch in recent years, with bigeye and yellowfin tunas together accounting for 37%. The effort exerted in the North Pacific by this fleet was low before 1994 but increased significantly thereafter. Most of the effort was concentrated in the central and mid- to high-latitudes. There are 36 purse seine vessels currently operating in the Pacific Ocean, and the dominant species in the catch is skipjack tuna (80%). Yellowfin tuna accounted for 19% and bigeye tuna only 1% of the total catch. The major fishing ground of DWPS fishery varied dynamically during recent years though mainly in the western and central tropical Pacific (135˚ E to 180˚ long., 8˚ N–8˚ S lat.). In 2002, the fishing grounds extended to 152˚ W, possibly due to the impact of El Niño. The total number of OSLL vessels operating in both the Pacific and Indian oceans in 2002 was estimated to be about 1,700. The catches of this fleet included those based at domestic ports and those at foreign ports. Yellowfin tuna was the dominant species in the landing in domestic ports of Taiwan, while bigeye and yellowfin tunas were co-dominate in foreign base landings. In addition, fishery monitoring and statistical data

collection activities as well as an observer program and research conducted by scientists in Taiwan were presented.

Discussion: Regarding the coverage rate for logbooks, the recovery of logbooks in the offshore longline fleet (about 1,700 boats) was said to be low but at 50-70% for the DWLL fleet. Catch information recorded by observers in the North Pacific are being entered into a computer system but are not yet available for use. Regarding catches for Taiwanese vessels owned but flagged in Vanuatu, Chinese-Taipei felt that the catch statistics and the vessels should be provided by the Vanuatu government. If data exist for Vanuatu vessels operating in eastern Pacific Ocean (EPO), the IATTC indicated they would have these data available for the ISC Statistics WG.

Japan (ISC/04/Plenary/04)

Japanese tuna fisheries consist of three major fisheries, i.e., longline, pure seine, pole-and-line, and other miscellaneous fisheries like troll, drift-net, set-net fisheries. Total landing of tunas, skipjack, swordfish and billfishes in the Pacific Ocean in 2001 was 500,301 t. Three major fisheries represent more than 93 % of catch in the recent years.

Longline fisheries are classified into three categories, i.e., coastal, offshore and distant water. Total catch of coastal longline fishery (vessels smaller than 20 gross registered ton (GRT)) is more than 40 thousand t in 2001. Albacore catch comprises almost half of the total catch and has increased remarkably since 1993. Total catch of offshore and distant water longline fisheries was 111,363 t in 2002. Bigeye has been the dominant species, and the catch in 2002 was 30,000 t. There are two different types of purse seine fleets that target tunas in Japan. The group seine fleet operates in temperate waters and consists of net purse seine vessels (100–200 GRT), searching vessels and carrier vessels. The single purse seine fleet (349–500 GRT) fishes mainly in the tropical waters, seasonally moving into the temperate water fishing ground. Total catch of the purse seine fishery was 220,000 t in 2002. Skipjack dominates the catch followed by yellowfin and bluefin tuna. The pole-and-line fishery is composed of three different categories, i.e., coastal (less than 20 GRT), offshore, and distant water boats. Catch by the coastal pole-and-line fishery is 10,000 t or less annually. Total catch of offshore and distant water pole-and-line was 145,000 t in 2002. Skipjack and albacore catches dominate total catch and were 91,000 t and 49,000 t, respectively.

Research on tuna includes aging, tagging with conventional and electrical tags, sonic tracking, and stock assessment.

Discussion: Regarding Figure 3 in the report showing Japanese purse seine effort southwest of Korea, Korea noted that they do not fish in that area. Japanese purse seine effort in the Yellow Sea targets small pelagic fish, and there are no Pacific bluefin tuna catches. It was clarified that while size distribution data for Pacific bluefin tuna were not included in the national report, they were provided to the species working group. The size range of most Pacific bluefin taken from waters off

Kyūshū is 50–60 cm fork length (FL). Purse seine vessels operating north of 20˚ N lat. do not employ fish aggregating devices (FADs).

Korea (ISC/04/Plenary/12)

Pacific bluefin tuna (PBF) are fished by various gears, either as target or bycatch species in the North Pacific. In Korean waters, PBF are mainly an incidental catch in the domestic purse seine fishery targeting mackerels. Therefore, the catches and size composition are not well monitored by the fishery statistical system. PBF caught in Korean waters are generally of small size less than one meter in length. Most are exported to the Japanese market for sashimi, with minor quantities consumed in Korea. The Korean government initiated an observer program for both domestic and high seas fisheries including tuna fisheries. During the years 2002 and 2003, the PBF catch amounted to 675 t and 1,591 t, respectively at the southern waters of Korea.

U.S.A. (ISC/04/Plenary/05)

The U.S. fishery consists of three large-scale commercial fisheries, the purse seine fishery for skipjack and yellowfin tunas, the distant-water troll fishery for albacore, and the longline fishery for large tunas and billfishes. There are also four mostly coastal commercial and recreational fisheries, the troll and handline fishery for tunas and billfish, a gill net fishery for tunas, a harpoon fishery for swordfish, and a pole-and-line fishery for skipjack tuna. Fishery monitoring activities include port, market, logbook, observer, and biological sampling. These programs are carried out by the newly formed Pacific Islands Fisheries Science Center (PIFSC) and the Southwest Fisheries Science Center (SWFSC) and are described for each fishery in the report. The number of boats participating in the U.S. fishery is provided in Table 1 of the US report while Table 2 of the US report contains catches from 1987-2003 by U.S. fleet. Both the 2002 and 2003 data are incomplete. The total production of the U.S. fishery was 35,700 t in 2002. The purse seine fishery in 2002 accounted for 36% of the total catch, with distant-water troll and longline accounting for 30% and 21%, respectively. Catches of albacore comprised 39% of the total catch, followed by yellowfin (22%), bigeye (16%), and skipjack (14%) tunas. The U.S. purse seine fishery is made up of an eastern and a western component. The eastern component started in the late 1950s and occurs off the Central American coast between 20º N and 20º S latitude west to 150º W longitude. There were only 4 boats participating in the fishery in 2001-2003. The estimated 2003 catch was 293 t of yellowfin tuna and 3,000 t of skipjack tuna. The central and western Pacific purse seine fishery started in 1976 and occurs between 10º N and 10º S latitude and from 150º W to 130º E longitude. Most of the catch is taken south of the equator. Skipjack tuna is the dominant component of the catch (73%). In 2002, the total catch was 3,600 t. The distant-water troll fishery for albacore started in the early 1960s and takes place off the U.S. Pacific coast west to 170º E longitude. In 2003, 670 vessels participated in the fishery, and in 2002 the catch was 10,700 t. The longline fishery started in the mid-1940s in Hawaii, expanded, contracted, and then expanded again in the late 1980s with establishment of the swordfish fishery and expansion of the market for sashimi-quality tuna. A longline fishery was established in California in 1991, targeting swordfish, and the

distribution of the two fisheries overlap in the North Pacific. The U.S. longline currently harvests around 8,000 t annually, with 1-2,000 t being swordfish and the remainder largely tunas. The PIFSC and the SWFSC conduct a number of research projects on tuna and tuna-like species including studies on the status of stocks, life history and ecology, fisheries oceanography, and movement and distribution.

6) Review and Assessment of Fish Species

a) **Pacific Bluefin Tuna Working Group (Z. Suzuki Chair, ISC/04/Plenary/06).** Participating in the Working Group were 23 scientists representing seven ISC Members and Observers. Exploitation of Pacific bluefin tuna (PBF) has a long history with catch statistics about 100 years long for fisheries in the coastal eastern Pacific. As a brief review of the biology and stock structure of PBF, the spawning grounds are located off southern Japan although some spawning occurs up the Pacific coast of Japan to 40˚ N. Age-0 occur in the waters around Japan, and then ages-1 and 2 migrate across the ocean to the eastern Pacific coastal area. Most of the fish of ages 3 to 5 migrate westward to the western Pacific. Some catches of PBF occur off Australia and New Zealand. Japan has the largest catch, with 70-80% purse seine, followed by troll, longline and set net. U.S. catches, primarily purse seine, were quite significant but in recent years Mexican purse seine replaced the US fishery. Chinese-Taipei has recently started catching large size PBF, and Korea has some purse seine catches of small PBF. The total catch has varied from 10,000–35,000 t, with an average between 20–25,000 t. Most of the catch is age 0 and 1, followed by age 3. A complicating factor in conducting the stock assessments was that some of the fishery statistics are substandard. MULTIFAN-CL and ADAPT VPA assessments show similar biomass trends, though some combinations of various size weightings of the MULTIFAN-CL analysis result in different long-term trends. Biomass was high in the mid 1950s, 1979, and mid-1990s. Recruitment has fluctuated with a large pulse in 1994 and very low recruitment in 1992. Changes in biomass and spawning stock biomass have been driven by recruitment. Yield per recruit estimates from the ADAPT modeling showed recent fishing mortality (F) exceeding $F_{max.}$ The status of the stock may be characterized as: 1) biomass appears to have recovered from a record low level in the late 1980s to a more intermediate level in recent years, largely due to better than average recruitment during the 1990s; 2) the SSB has generally declined since 1995 despite good recruitment and will likely continue to decline if recent fishing mortality rates continue; 3) recent fishing mortality is greater than F_{max}, which has both economic implications and is an indicator of biological concern; and 4) the high fishing mortality on young fish (ages 0–2) and older fish (ages 6+) may be cause for concern with respect to maintaining a sustainable fishery in future years. Implications of the stock status include: 1) no further increases in fishing mortality (F) for any of the fisheries taking PBF; and 2) reduce the uncertainty associated with the assessment results by undertaking improvement in the data collection, data analyses, and assessment models used. Several recommendations were made by the planning team involving fishery statistics, biological studies, and stock assessment, with a note that making significant progress on stock assessment may require an intercessional meeting.

Discussion: The Working Group recognizes that food web and predator- prey studies will be needed in the future to address ecosystem management concerns. The concern of the Working Group regarding the high exploitation rates on age 0–1 was noted.

b) Swordfish (B. Humphreys Chair, P. Kleiber presenting, ISC/04/Plenary/07)
Participating in the Working Group were 25 scientists representing six ISC Members and Observers. Regarding fishery statistics, it was not clear to what extent Chinese-Taipei landings at Pacific island ports and catches in the Indian Ocean were included.

Review of the biology, ecology, and oceanography included studies on: 1) age and growth, including very young fish and regional differences in the growth of older fish, 2) movement – 18 returns from 521 traditional tag releases showing some long east-west movement; 29 popup satellite archival tags (PSATs) with recovered data showed expected diurnal movement, surprising periods of resting at surface, and tag attachment problems were experienced, 3) stock structure – the most recent study suggested a sideways horse shoe distribution with the two ends in the northwest and southwest Pacific representing the greatest divergence; genetic samples have recently been collected but not yet analyzed; so far, less genetic differentiation has be found in the Pacific than in the Atlantic; a micro-chemical study has been started, and 4) a feeding habit study – found seasonal shifts; these data may be useful for EcoSim type modeling.

Status of stocks studies included: 1) three different analyses for standardizing CPUE – generalized linear model (GLM) and habitat-based both showing declining CPUE trend, with greater decreases in NW, 2) a MULTIFAN-CL modeling effort – difficulty with size sampling protocols that ignore small fish (e.g., in Japan) complicate the analysis; overall impact of the fishery is minor at worst; use of a simulation data set to test MULTIFAN-CL indicated a significant tendency to overestimate natural mortality (M) and thus underestimate stock levels.

Conclusions reached by the Working Group on the status of swordfish in the North Pacific are: 1) GLM and habitat-based standardization of CPUE based data from Japanese longline vessels show declining trends mainly driven by declines in CPUE in the northwest portion of the study area; 2) a MULTIFAN-CL assessment also detected such a decline in the northwest region of the fishery; and 3) in all MULTIFAN-CL model runs, the model showed fisheries as playing no more than a modest role in causing declines in abundance.

The work plan developed by the Working Group includes further development of spatially explicit, integrated models for stock assessment, continued biological and oceanographic research, and establishing a comprehensive swordfish database. Regarding requests from the Statistics Working Group, the Swordfish

Working Group recommended against defining sub-areas at this time, recommended adopting eye-to-fork length (EFL) as the standard length measure for swordfish, recommended that size conversion formulae will need to be re-examined periodically to maintain their usefulness, and lastly recommended strongly that the annual catch totals must include catches from major fisheries that are unloaded in foreign ports. The Working Group suggested an intercessional meeting be held before the next ISC Plenary.

Discussion: While the North Pacific-wide swordfish stock assessment suggests that the fishery is not having a substantial impact on the stock, the recently described declining trends in the index of abundance in the northwest Pacific are cause for some concern. These fishing grounds have been fished continuously since the beginning of the longline fishery and have long been a high production area. It was suggested that the declines in the northwest might be the first signs of a problem in the fishery, though the declines could be due to a number of factors in addition to fishing pressure. With the level of uncertainty in the status of the stock, whether the stock could sustain further increases in fishing effort has the same level of uncertainty. Whether increases in fishing mortality for the entire fishery or in areas more lightly fished than in the northwest should be viewed with the same level of concern was discussed but not resolved. It was suggested that the level of uncertainly in the assessment could be reduced by incorporating additional size composition data, by expanding swordfish tagging efforts, and possibly by using other stock assessment models in addition to MULTIFAN-CL. Allowing MULTIFAN-CL to estimate natural mortality estimate (0.7 per annum) or fixing it at 0.2 had considerable impact on estimates of fishing mortality; however, all model runs suggested the fishery had not approached the maximum sustainable yield (MSY) level.

c) Marlins (G. DiNardo presenting, ISC/04/Plenary/08).

This was the first meeting of the Working Group. Participating in the Working Group were 26 scientists representing six ISC Members and Observers. Reviewed were studies on the size composition and sex ratios of blue and striped marlins, a GLM standardization of CPUE for striped marlin, comparison of observer and logbook data for blue marlin in the Hawaii longline fishery, stock structure hypotheses for Pacific marlins, sport angler survey program, and post release mortality. Emerging issues identified by the Working Group included: 1) the need for a collaborative Pacific-wide assessment of striped marlin to be undertaken, 2) the desirability of including oceanographic information into the stock assessments; 3) the need for coordination and collaborating among ongoing tagging programs Pacific-wide; and 4) in the short-term, stock assessment efforts should concentrate on blue and striped marlin. A detailed work plan involving movement and stock structure, age and growth, stock assessment modeling, and development of a comprehensive data base was developed. The Working Group indicated that an intercessional meeting would be beneficial before the 2005 ISC meeting.

Discussion: In response to a question from the Chair, tagging to identify vertical habitat use was indeed part of the work plan.

d) Albacore tuna (G. Sakagawa presenting on behalf of the NPAWS, ISC/04/Plenary/09).

The Eighteenth North Pacific Albacore Workshop (NPALBW) was held at the Southwest Fisheries Science Center, NOAA Fisheries, La Jolla, California from December 4 to 11, 2002. Scientists from Canada, Japan, Taiwan, United States and the Inter-American Tropical Tuna Commission participated in the Workshop. A total of 17 working papers and nine information documents were submitted for reference and review.

The NPALBW focused largely on reviewing progress with work plan and research assignments applicable to the North Pacific albacore population (*Thunnus alalunga*), particularly, in the context of preparing stock assessment models based on various estimation approaches, which are to be reviewed late in 2004 at the Nineteenth NPALBW. Also, the review included catch statistics and fishery developments.

Catch statistics for the past five years indicated that Japan accounted for the largest share (69%), followed by the United States (15%), Taiwan (12%) and Canada (4%). Belize, Cook Islands, Ecuador, Korea, Mexico and Tonga 'flag' vessels also caught albacore, but accounted for minor amounts. Total catch varied annually, but during the 1950s averaged close to 60,000 t. In the 1960s and 1970s, total catch increased to a peak of 125,400 t in 1976, before declining to a record low of 37, 900 t in 1991. In the early 1990s, the catch began increasing once again, reaching a high of 121,300 t in 1999, before falling back to 84,000 t in 2000, 92,000 t in 2001 and 89,000 t in 2002. The fishing areas and sizes of fish caught by the major fisheries remained virtually unchanged during these years of varied catches.

The review of work plan assignments indicated that considerable progress was being made with developing catch-at-size and catch-at-age matrices, estimating abundance indices based on catch-per-unit-effort (e.g., fishery-specific CPUE time series) and biological (e.g., size distributions) data and with developing length-based, age-structured assessment models. Progress was also being made with increasing understanding of albacore behavior and movements based on archival tagging studies, and with designing a study on albacore reproductive biology for purposes of re-examining hypothesized maturity schedules.

A primary focus of the NPALBW was review of methods and results generated from length-based, age-structured stock assessments, including virtual population analysis (VPA) based on ADAPT models and preliminary, fully-integrated statistical models based on MULTIFAN-CL software (see Plenary Document 09). Results from the ADAPT models indicated that annual estimates of biomass over the last decade were relatively 'high' (i.e., compared with estimated biomass in

the mid 1970s through the late 1980s); however, very recent population estimates suggest a 'leveling off' of the stock at large. Estimated recruitment is quite variable and suggests two oceanographic regimes: a low 'productivity' period from 1975 to 1989; and a higher 'productivity' period since that time. Based on recent and forecasted catch and recruitment levels, fishing mortality is relatively high (roughly, F 20%), either in excess of that required to produce MSY assuming a low productivity scenario or roughly at the MSY level assuming a high productivity scenario and proxy biological reference points for this species.

Further progress with work plan assignments is expected in the coming months leading up to the Nineteenth NPALBW in Nanaimo, Canada in December 2004. Best information available at that time will be used in an analysis of the stock status of North Pacific albacore.

Discussion: The current poor understanding of the recruitment process resulting recently in high stock levels and the different trajectories of biomass under the two recruitment regimes do not support further increases in fishing mortality. The albacore researchers looked at F_{MSY} proxies as a proxy or benchmark, rather than an official reference point.

e) Bigeye tuna (N. Miyabe presenting from 16th Standing Committee on Tuna and Billfish meeting)

Scientists from Chinese-Taipei, Japan, the IATTC, the U.S., and the SPC's Ocean Fisheries Program collaborated on assessing western and central Pacific bigeye tuna. The longline fishery dominated until early 1990. In the EPO, the surface fishery dominates in some years thereafter while in western and central Pacific; the surface fishery has become more important but still secondary to the longline fishery. MULTIFAN-CL was used as the assessment tool. Five different standardized CPUE series were used, namely GLM, habitat (using Tahiti and Hawaii sonic tracking data), StatHBS (statistical habitat-based model), and FPOW (assumed increase in fishing power efficiency). The GLM standardization series was given preference because archival tagging studies yielded variable results, thus impacting the habitat type standardization approaches. In contrast to last year's assessment, recruitment shows an increasing trend in recent years in many areas. Biomass exhibits a generally declining trend. The model estimates that the fishery is having an impact on biomass, particularly in regions 2 and 3 where the stock is most heavily exploited. Exploitation rates have negative slopes exceeding MSY levels in these two regions. The yield production curve estimated from the analysis indicates that overfishing is occurring. $Biomass/Biomass_{MSY}$ is still over 1.0 but down from earlier years (all in light of increased recruitment). Possible reasons why results differ between last year and this year include: 1) extension of the data back to 1952 and 2) different effort (CPUE) standardized series for longline fishery used to calibrate the model. Other points raised include: 1) recent yields could be continued only if recent average recruit levels continued; 2) current biomass is greater than B_{MSY} because of above-average recent recruitment; 3) biomass would decline if recruitment returns to the average level;

and 4) MSY is estimated at 40- 90,000 t given long-term average recruitment, and 80, 000 t given recent recruitment levels.

(IATTC assessment by S. Harley for the EPO presented by M. Hinton)
This assessment was conducted using the A-SCALA model. Recruitment was stable during the period 1975–1993 (at or below replacement), at higher levels for some years but wider bounds, then down generally to the low previous level. The spawning biomass ratio (SBR) was level during the period 1975–1989, then fluctuated but eventually fell below the critical level. Under assumed recent effort and recruitment levels, predicted future catch has a slight upward trend for the surface fishery and a very modest decline for the longline fishery. In summary, most cohorts since 1998 have been below average and total and spawning biomass will decrease in future. The IATTC has implemented restrictions for the conservation of bigeye tuna, specifically a sub-area closure (12/1 – 12/31/2003), a closure of the entire EPO (8/1 – 9/11, 2004), and longline catch by flag in 2004 not to exceed 2001 levels.

Discussion: Vertical habitat utilization data from sonic tracking and archival tags are essential for developing the habitat-based effort standardization models. Since there is high variability in diving patterns, collecting more data may help but redesign of the tagging studies may be required as well. It was observed that some of the conclusions stated and estimated trends differed or indeed were in conflict. The different standardized CPUE time series resulted in substantially different assessment results, but in all cases in the aggregate, current biomass is above biomass at MSY.

f) Yellowfin tuna.
(IATTC assessment by M. Maunder for the EPO presented by M. Hinton).
The assessment model used is A-SCALA, which is an open source code run under AD Model builder. There seem to be high and low recruitment periods in the fishery. Comparative results in sequential years resulted in similar biomass trends except in the last 2 years. SBR fell below 0.4 early in the time series but was generally above in later years. Sequential SBR plots have similar trends but at two different levels. The results seem to be robust. Conclusions resulting from the analysis are: 1) SBR ~ SBR_{MSY}; 2) $F < F_{MSY}$; 3) average weight is much less than critical weight and increasing average weight could substantially increase MSY.

(**Western-central Pacific assessment from SCTB16 presented by K. Bigelow)**
Purse seine accounts for the largest catch, with longline at 100,000 t, followed by mixed fisheries in the Philippines and elsewhere. The Philippine and Indonesian fisheries harvest small fish, the purse seine fishery middle sized fish, and mid-sized by the longline fishery. The fishery occurs mostly in the tropics. Five standardized CPUE time series were used (GLM, habitat based, statistical habitat-based, and FPOW-GLM (assumptions regarding fishing power). Five sub-areas were employed. The GLM CPUE time series resulted in the most pessimistic assessment. Catch and effort data since 1952 were incorporated into the

assessment. Regarding recruitment, it appeared to be stable in most sub-areas with fluctuations. The habitat standardization series indicate increased recruitment while others CPUE trends result in stable recruitment. The model indicated declining biomass trends in most areas and increasing fishing mortality. The fishery has the greatest impact on biomass in the two tropical areas. Regarding reference points, F/F_{MSY} increases after 1990 but remains below the critical point while B/B_{MSY} is fluctuating but is above the critical point. In conclusions, the impact of the fishery overall has been mild, but substantial in the two tropical regions where the reference points fall below their MSY levels.

Discussion. The SCTB did make recommendations regarding effort controls in spite of the uncertainty in the assessment, namely it repeated its recommendation from last year that F levels should not be allowed to increase, particularly on juveniles.

g) Summary of Stock Status and Recommendations

The ISC was presented with stock assessments reviewed by the SCTB and conducted by the IATTC for yellowfin and bigeye tunas. In reviewing these assessments, the ISC noted that the IATTC has instituted management measures to reduce the fishing mortality on younger bigeye tuna with the same effect on yellowfin tuna in the EPO. The SCTB assessments recommend that there be no increase in fishing mortality for yellowfin and bigeye tunas in the western and central Pacific.

The ISC noted that the assessments presented to it for albacore and Pacific bluefin tuna in the North Pacific conclude that the current fishing mortality for each species exceeds most standard reference points for sustainable levels of fishing mortality. Therefore, while there is currently no management authority specifically requesting management advice from the ISC, the ISC noted that the advice given by the SCTB for their assessed species is also consistent with the current condition of both albacore and Pacific bluefin tuna in the North Pacific.

Furthermore, the ISC is aware of the global concern for excess fishing capacity and that there is an FAO International Plan of Action for Overcapacity, and the resolutions of the IATTC limiting the capacity of vessels fishing for tunas in the EPO. Taking into account the assessments for all major tuna species within the Pacific Ocean, except skipjack tuna, the ISC noted that any increases in tuna fishing capacity for any and all of those species would make worse the condition of those stocks and significantly complicate future management efforts.

Assessment summaries for ISC species of interest

Pacific bluefin tuna. Recent F is greater than F_{max}, which has economic implications (too much fishing effort for the yield returned) and is also generally taken as an indicator of biological concern. In particular, the high F on young fish (ages 0-2) and older fish (ages 6+) are cause for concern with respect to maintaining sustainable fisheries in the future.

Albacore tuna in the North Pacific. Assessment results indicate that due to good recruitment, biomass has generally trended upward over the last decade. However, recent fishing mortality rates (F) are at a high level (roughly, $F_{20\%}$) and both total biomass and spawning stock biomass are projected to decline even if good recruitment persists. Current F is in excess of many biological reference points that are commonly used as candidates for Fmsy proxies for fish populations.

Yellowfin tuna in the western and central Pacific (WCPO) and eastern Pacific Ocean (EPO). The ISC was presented with stock assessments reviewed by the SCTB and conducted by the IATTC for yellowfin and bigeye tunas. The ISC noted the concern of full exploitation of the yellowfin stock in equatorial areas and concurs with the SCTB in regard to no further increases in fishing mortality, especially for juvenile yellowfin. Similar to yellowfin in the WCPO, the stock in the EPO is also estimated to be near or at full exploitation and there is uncertainty about recent and future recruitment and biomass levels.

Pacific bigeye tuna. The ISC notes the inconsistency in results between the 2002 and 2003 assessment and hopes that future assessments will resolve the issue. The SCTB believes that there should be no further increase in the fishing mortality rate for bigeye tuna, until the results are further confirmed. The ISC also notes the pessimistic view of the 2003 assessment suggesting that overfishing may be occurring ($F_{current}/F_{MSY}>1.0$), but the bigeye stock is not yet overfished ($B_{current}/B_{MSY}>1.0$). In the EPO, the IATTC has implemented conservation measures to limit fishing mortality through area and/or time closures.

Swordfish. Results of preliminary modeling of a north Pacific swordfish stock in areas north of 10°N indicate that in recent years the biomass level has been stable and well above 50% of the unexploited levels of stock biomass, implying that swordfish are not over-exploited at current levels of fishing effort. The current interpretation is that the stock is neither overfished ($B_{current}/B_{MSY}=1.7$) nor is overfishing occurring ($F_{current}/F_{MSY}=0.3$).

Marlins. As this was the first meeting of the Marlin Working Group, there is no status of stock information presented. The working group did agree that a striped marlin stock assessment should proceed, but in a collaborative setting, including scientists from the U.S. Pacific Islands Fishery Science Center, National Research Institute of Far Seas Fisheries, and the Inter-American Tropical Tuna Commission. An assessment from the EPO indicated that the stock(s) of striped marlin are apparently in good condition, with current and nearterm anticipated fishing effort less than that required to produce the MSY. The most recent stock assessment for blue marlin in 2002 indicted that a Pacific-wide stock was near MSY.

7) Report of Statistics Working Group (ISC/04/Plenary/10)

Twenty-seven participants from Members and the IATTC participated in this session. The Working Group reviewed the results of the previous meeting: 1) the definitions of and terms of reporting for Category I, II, and III data; 2) the ISC Web site has been up and running since Dec. 2002 and contains press releases, guidelines, membership, structure, and meeting reports; 3) the ISC database on which little progress has been made; and 4) requests made to the species working groups to designate standard measures and conversion formulae as well as sub-areas for compiling Category I data.

The inventory of available data in Categories I, II, and III was updated with additional years of data. During these proceedings, the Swordfish Working Group and the Marlin Working Group designated eye-to-fork length as the standard length measure while the Pacific Bluefin Working Group designated fork length as the standard. Recommendation and future plans include the following. First, Japan will establish the central database by April 2004 via contract, starting with a simple design and improving incrementally. Since some agencies are starting to use observer collected data in stock assessment work rather than logbook data, the Working Group considered adding an additional data category. With the considerable variation in purpose of observer programs and data elements collected by member nations, the Working Group decided at this time to have members submit a description of their observer programs consisting of purpose, scope, and data fields. The Working Group reviewed issues regarding monitoring of fish farming activities and recommended that all fish captured for fish farming, including those discarded before being transferred to the pens be considered as "catch" and be reported together with retained and landed catches. For clarity, a statement to this effect should be included with the submitted data. The production (weight of farmed fish sales) should not be concluded in catch statistics, but rather reported separately. Members and contributors are to submit data by December 31, 2004, with the regular schedule given in last years report thereafter commencing. The list of data correspondents was updated, and Japan agreed to contact China for the name of their correspondent. Next meeting will be held in conjunction with the next ISC Plenary, and should be held after the species working group meetings.

8) ISC Assumption of North Pacific Albacore Working Group (ISC/04/Plenary/11)

A consensus of the Members was quickly reached for inviting the NPAWG to join the ISC as well as sending a letter immediately after the ISC formally inviting them to join. It was noted that the NPAWG will convene following this meeting and consider this invitation.

9) Review and Adoption of Operational Rules (Chair NPAWG Sakagawa, ISC/04/Plenary/11)

During the18th meeting of the NPALBW given likely involvement with the ISC, the rules and procedures were formalized to ensure continued effectiveness of the NPAWG. Participants also looked at procedures used by other international scientific

bodies. The draft includes two types of "observers", permanent observers such as intergovernmental agencies like the IATTC and invited observers such as non-governmental organizations. Various paragraphs were described, such as C1 Membership, C2 Chairperson (the job, how nominated, election, term of 3 years), C3 Vice Chair (responsibilities, selection, term of office 3 years), C4 Reports, C5 Exchange of data rules, C6 Invited experts and observers (basically closed to members and permanent observers), C7 Subsidiary bodies, C8 Frequency of meetings, C9 Peer review, and C10 Other procedures (allow to adopt others as needed). The working group paragraphs were also described: W1 Membership, W2 Chairperson (responsibility; term of office (3 years)), W3 Frequency of meeting & intersession meetings, W4 Experts and invited observers, W5 Format for species working group reports, and W6 Format of Statistics Working Group report. The draft calls for a Steering Group made up of the chair, vice-chair, and working group chairs.

Discussion. The rules and procedures were discussed at length resulting in a number of changes to the draft text. The final, edited version is attached as Appendix 4.

10) Relationship between ISC and the WCPFC

The relationship of the ISC to the WCPFC (including its Northern Committee) and IATTC were discussed at length. It was the consensus of the Members to continue the ISC as an independent body to provide scientific advice from a Pacific-wide perspective on North Pacific tuna and tuna-like resources. The specifics of any relationship with the WCPFC and the IATTC will be decided in the future.

11) Establishment of an ISC Secretariat

Japan offered to host a permanent Secretariat that is minimal but efficient. The early focus would be on maintaining the ISC database and Web site for providing access to data and information on a timely basis. In addition, coordination with the WCPFC and other international bodies would become an increasingly more important function with time. There was consensus of the Members that this represented a positive step forward in strengthening of the ISC. Financial matters, staffing, and running of the Secretariat need to be worked out, as well as how the Secretariat relates to the rules and procedures being adopted. Japan indicated they would provide a more formal proposal (dollars, etc.) for their financial support of the minimal secretariat. Katsumasa Miyauchi, Fisheries Agency of Japan, will be the correspondent for exchanging communications regarding the proposal.

12) Bycatch Working Group Establishment

The U.S. proposed that a bycatch working group be established because bycatch is an important fishery issue. Since the species involved have pan-North Pacific populations, it would be appropriate for the ISC to address the issue. There was consensus of the Members for the formation of such a working group. Member countries need to nominate participants to the working group so the group can start moving forward. The working group would focus on sea turtles, sea birds, and sharks.

Important functions of the working group would be to compile data throughout the range of the species and assess their status. Members approved terms of reference for the Bycatch Working Group (Appendix 5).

13) Other Matters

Bigeye Tuna Working Group. The Chair observed that the Bigeye Working Group had never met and asked whether it should be dissolved. The delegate from Japan indicated that they had proposed establishment of the Working Group, but since it had never met and the SCTB and the IATTC have active working groups, and the WCPFC would likely have as well, he recommended that it be dissolved. Consensus was reached by Members to dissolve the Bigeye Tuna Working Group.

Revisit to the ISC data protocol. The IATTC recommended that paragraph C5 Exchange of data be amended so that when non-contributing member requests specific data, only the contributor of the data need be contacted for approval to distribute rather than all contributors. There was consensus of the Members on this suggestion. The revised data protocol is included as an attachment to Appendix 4.

14) Next Meeting

Japan offered to host the next meeting of the ISC Plenary which probably will occur in February 2005. Japan suggested that it was not necessary to schedule a meeting of the working groups, noting that a number of them had scheduled intercessional meetings.

15) Adoption of the Report

The U.S. suggests that the Chair of the ISC will serve as Chair until the next meeting to facilitate progress on work items agreed to in the ISC4. The draft report of the fourth meeting of the ISC plenary was adopted.

16) Closing

The meeting was adjourned at 14:30 on 4 February 2004. The chairman thanked all of the participants for their efforts in making ISC4 a successful meeting.

Appendix 1

Fourth Meeting of the Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific

Plenary Session

1) Opening
2) Opening Statement
3) Selection of Chairman and Rapporteurs
4) Adoption of Agenda
5) Delegation Reports of Fisheries Regarding Tuna and Tuna-like Species
6) Review and Assessment of Fish Species
    a) Pacific Bluefin Tuna
    b) Swordfish
    c) Marlins
    d) Albacore tuna
    e) Bigeye tuna
    f) Yellowfin tuna
    g) Summary of Stock Status and Recommendations
7) Report of Statistics Working Group
8) ISC Assumption of North Pacific Albacore Working Group
9) Review and Adoption of Operational Rules
10) Relationship between ISC and the WCPFC
11) Establishment of an ISC Secretariat
12) Establishment of a Bycatch Working Group
13) Other Matters
14) Next Meeting
15) Adoption of Report
16) Closing

Appendix 2

ISC/04/Plenary/1	The 2002 Canadian North Pacific Albacore Troll Fishery Max Stocker and William Shaw (Canada)
ISC/04/Plenary/2	Mexico Progress Report on Tuna and Tuna-Like Species Pedro Ulloa, Luis Fleischer, Michel Dreyfrus and Juan Guillermo Vaca R. (Mexico)
ISC/04/Plenary/3	Recent Status of Taiwanese Tuna Fisheries in the North Pacific Region Chou Shih-Chin and Chin-Lau Kuo (Taipei, Taiwan)
ISC/04/Plenary/4	National Report of Japan Miki Ogura (Japan)
ISC/04/Plenary/5	U.S. National Report to ISC4 on North Pacific Pelagic Fisheries Pacific Islands Fisheries Science Center (PIFSC) and Southwest Fisheries Science Center SWFSC (United States)
ISC/04/Plenary/6	Report of the 3rd ISC Pacific Bluefin Tuna Working Group
ISC/04/Plenary/7	Report of the Swordfish Working Group
ISC/04/Plenary/8	Report of the Marlin Working Group
ISC/04/Plenary/9	Report of the Eighteenth North Pacific Albacore Workshop P.R. Crone and R.J. Conser (United States)
ISC/04/Plenary/10	Report of the Statistics Working Group
ISC/04/Plenary/11	Draft Rules and Procedures for Conduct of the ISC Committee and Subsidiary Bodies North Pacific Albacore Group
ISC/04/Plenary/12	Korean National Report to 4th ISC on Tuna Fisheries in the Waters off Korea as By-catch species Jeongrack Koh and Dae-Yeon Moon (Korea)
ISC/04/Plenary/BP/1	Report of the Plenary Session of the Third Meeting of the Interim Scientific Committee on Tunas and Tuna-Like Species in the North Pacific (ISC), Nagasaki, Japan
ISC/04/Plenary/BP/2	Stock Status – WCPO Yellowin Tuna

Appendix 3

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Appendix 4

RULES AND PROCEDURES FOR CONDUCT OF THE ISC COMMITTEE AND SUBSIDIARY BODIES

Background

The Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) was established in 1995 for the purpose of enhancing scientific research and cooperation for conservation and rational utilization of tuna and tuna-like species (HMS) of the North Pacific Ocean, and to establish the scientific groundwork, if at some point in the future it is decided to create a multilateral regime for the conservation and rational utilization of the HMS species in the North Pacific Ocean.

The Committee

The Committee is made up of Members from coastal states and fishing entities of the region and coastal states and fishing entities with vessels fishing for HMS in the region, and permanent observers (Observers) from relevant intergovernmental fishery and marine science organizations, recognized by all members. Its functions are to regularly assess and analyze fishery and other relevant information concerning the species covered; prepare reports of its findings or conclusions on the status of the species covered, including trends in population abundance, developments in fisheries, and conservation needs. It promotes research cooperation and collaboration among members by developing proposals for conduct of and, to the extent possible, coordinates international and national programs of research addressing the species covered. Furthermore, it takes into account the work and findings of other relevant technical and scientific organizations in execution of its functions.

C1. *Membership.* The Committee consists of representatives with suitable scientific and fisheries qualifications. Current Members shall review the eligibility of prospective Members and permanent Observers before admission. Each Member and Observer shall have the right to appoint one representative (Leader), an alternate, if desired, and to be accompanied by experts or advisors with suitable scientific and fisheries qualifications to participate on the Committee. The Leaders are the main source of contact for ISC communications.

C2. *Chairperson*. A Chairperson shall be elected by Members of the Committee.

The Chairperson serves as the leader of the Committee and is responsible for advancing the objectives of the ISC in a cost-effective and efficient manner. Responsibilities include chairing meetings of the Committee and supervising the work of subsidiary bodies, organizing meetings of the Committee, ensuring that ISC assignments and commitments

are completed in a timely, efficient manner, and coordinates activities with the Chairpersons of subsidiary bodies. Additional duties with respect to preparations for meetings include: (1) distribute a draft meeting agenda 90 days in advance and soliciting comments, (2) coordinate arrangements, (3) ensure that reports of subsidiary bodies and results of assignments are available on a timely basis, (4) appoint and distribute a list of proposed invited experts for approval by Members in advance of the meeting (see C6), (5) appoint rapporteurs, and (6) perform other matters that are required for smooth preparation and functioning of a meeting. In conducting meetings, the Chairperson shall strive for consensus of all Members in Committee decisions, conclusions and findings.

- Nominees for Chairperson are from Members attending the meeting.

- The Chairperson is elected by secret ballot, one vote per Member and by majority vote of Members attending the meeting. The first round of an election will consist of each voting Member having the opportunity to submit one nominee's name on a secret ballot. If the same name appears on a majority of ballots submitted, that candidate shall be declared the elected Chairperson. If no majority of nominee appears on the ballots, the two nominees receiving the most votes would be the candidates for the second round. Members would vote for one of the candidates in the second round and the candidate receiving the majority of votes submitted shall be declared the elected Chairperson. If a tie vote results, a third round of voting between the two nominees shall be held in order to secure a candidate with majority votes.

- The Chairperson serves for a term of three years and is eligible for re-election for one additional three-year term.

C3. *Vice Chairperson.* A Vice Chairperson shall be elected by members of the Committee. In the absence of the Chairperson, the Vice Chairperson assumes all duties and responsibilities of the Chairperson.

- The runner-up candidate in the second or third round of the election for Chairperson shall be declared the elected Vice Chairperson. If only one nominee results from the first round of the election for Chairperson, the Chairperson election process shall be applied to elect a Vice Chairperson

- The Vice Chairperson serves for a term of three years and is eligible for re-election for additional terms.

C4. *Reports*. Reports of findings, decisions and conclusions are prepared by the Committee for the record and for distribution. In adopting a report, the Committee strives for consensus of all Members; however, if reasonable efforts fail to reach a consensus, reports and findings may reflect opinions and the differing views.

C5. *Exchange of fisheries and biological data*. Timely exchange of complete and accurate fisheries and biological data are primary obligations of participants of the ISC.

Each Member and Observer of the Committee shall appoint a Data Correspondent, who shall be responsible for meeting all requirements for timely submission of complete and accurate data as specified by the Data Protocol of the ISC (Attachment).

C6. *Invited experts.* Scientific and fisheries experts, who are not Members of the Committee may be invited to participate in the deliberations or work of the Committee. Decision on inviting experts, nominated by Members, shall be made by consensus of Members of the Committee. The Chairperson will be responsible for preparing the list of nominees, nominated by Members no later than 90 days before the event, and immediately distribute to Members for approval. If no objections are received by 45 days of the event, the Chairperson shall issue invitations to approved nominees. The manner of invited experts' participation shall be decided by the Members. Invited experts are not eligible to vote on ISC matters.

C7. *Subsidiary bodies.* The Committee may establish subsidiary bodies, including Working Groups, which may meet in the interim between Committee meetings, or more frequently, and report to the Committee.

C8. *Frequency of meetings.* The Committee shall meet once every two years or more frequently if required and agreed to by the Members. The time and place of meetings shall be decided by the Members. The working language of all meetings will be English and for the plenary sessions of Committee meetings only, with formal interpretation into Japanese.

C9. *Peer review of function.* Every five years, or more frequently as may be decided, the Committee shall organize a team of three recognized peers with no Committee affiliation, to review the function of the Committee and subsidiary bodies and to offer recommendations for improvement.

C10. *Other procedures.* The Committee will establish by consensus other procedures as required for conduct of activities. It can be dissolved by consensus of Members.

Working Groups

In 1996, the ISC Committee established three species Working Groups (Bigeye Tuna Working Group, Pacific Bluefin Tuna Working Group and Swordfish Working Group) and a Statistical Working Group. A fourth species Working Group, the Marlin Working Group, was created in 1999. In 2004, the Bigeye Tuna Working Group was dissolved and a By-Catch Working Group was created. These Working Groups are subsidiary bodies of the Committee and report to the Committee. Each provide a forum for cooperation/collaboration in research by Member and Observer scientists as well as for focused consideration of technical matters assigned by the Committee. The species Working Groups' primarily focus is on understanding the dynamics and ecology of the HMS and associated-species populations in order to accurately assess stock condition and status. The Statistical Working Group focuses on collection, exchange and archiving of fishery, biological and other data needed for stock assessments and for monitoring fishery

developments and by-catch. The work of these Working Groups is guided by multi-year work plans and demands by the Committee.

W1. *Membership*. Working Groups shall be constituted of scientists with appropriate credentials and experience. They are appointed by Members and Observers of the Committee.

W2. *Chairperson.* A Chairperson with appropriate expertise and knowledge is to be chosen by members of each Working Group.

- The Working Group Chairpersons are responsible for chairing meetings of the Working Groups, facilitating the development of multi-year work plans and coordinating work plan assignments, organizing meetings, including advanced preparation of agendas, scheduling of presenters, appointing of rapporteurs, providing assignments for reports, and ensuring that Committee assignments are completed as required. The Chairpersons also serves as facilitators of views, to ensure that participants with differing views get an opportunity to be heard. They strive for consensus of all members in reporting of Working Group findings, conclusions and decisions to the Committee.

- The Chairperson serves a three-year term and may be reappointed for an additional three-year term, but not for more than two consecutive terms.

W3. *Frequency of meetings*. Time and place of Working Group meetings are decided in consultation with the Committee. In general, Working Groups meet between Committee meetings, or more frequently as needed to complete assignments and with a view to reporting findings and results to the Committee in a timely manner.

W4. *Invited experts*. Occasionally, a Working Group may have a need for special expertise to assist in assignments or may receive requests for participation from experts. On such occasions, the Working Group Chairperson is responsible for following Rule C6 and consulting with the Committee Chairperson.

W5. *Format for species Working Group reports*. The focus of species Working Groups is largely understanding the population dynamics of the concerned species in order to accurately assess stock condition. Sufficient understanding for conducting a stock assessment may not accumulate on a regular, predictable schedule for conducting a stock assessment on a regular basis. Species Working Group findings, therefore, may be progress reports for stretches of time before a "current" stock assessment is available. To maintain consistency among reports of species Working Groups and from one year to the next, the following is an outline for Working Group reports destined for submission to the Committee. This outline may be modified by the Committee to meet changing assignments.

A. Introduction.

B. Review of Recent Fisheries (Description of recent developments and issues of fisheries.)
C. Fishery Statistics (Presentation of fishing area by gear, time series of landings or catches, catch-effort or CPUE trends, size composition and other biological statistics, e.g., sex ratio and by-catch.)
D. Review of Biological Studies (Research results from biological working papers and summary of comments by participants.)
E. Review of Stock Assessment Studies (Research results from stock assessment working papers and summary of discussion.)
F. Current Stock Status (If results of stock assessment studies provide a basis for an overall assessment of stock condition, conclusions on current stock condition, including relative to conventional acceptable biological reference points and uncertainty should be provided.)
G. Special Assignments. (Advice on assignments from the Committee, including scientific advice on potential biological consequences of fisheries management actions and natural events.)
H. Research Recommendations and Updated Work Plan (Recommendations should be reported by category, statistics, biological studies and stock assessment and focused for advancing understanding of the resource, particularly for more accurate stock assessments.)
I. Administrative Matters (A catch-all section for time and place for next meeting, acknowledgments, and discussion of other administrative matters.)
J. Adjournment.

Findings, conclusions, and decisions of Working Groups are to be agreed by consensus; however, if reasonable efforts are made and fail to yield consensus, reports and findings may reflect opinions and the differing views. A research plan that would resolve or clarify the different views might also be proposed.

W6. *Format for the Statistical Working Group report.* The main focus of the Statistical Working Group is the collection of accurate fishery statistics, biological and other data in support of stock assessment research, and to coordinate timely exchange and reporting of those data. As such, Data Correspondents should serve on this Working Group. The following is an outline for reports of the Statistical Working Group:

A. Introduction.
B. Review of Data Requirements for Stock Assessment and Fishery Monitoring.
C. Review of Data Collected by Participants.
D. Updating of Data Inventory and Depository.
E. Review of Data Reporting Protocol (reporting schedule, data access and availability, data correspondence).
F. Conclusions, Recommendations and Updated Work Plan.
G. Administrative Matters.
H. Adjournment.

Steering Group

The Steering Group is an ad hoc body consisting of the Committee Chairperson and Vice Chairperson, Chairpersons of the Working Groups and one to three experienced Committee scientists invited to serve by the Committee Chairperson. This Group is responsible for assisting the Committee Chairperson in planning, organizing and coordinating activities and meetings of the Committee and for providing advice to the Committee Chairperson on administrative matters that arise during the inter-sessional period.

Adopted ISC4, February 4, 2004

Attachment

DATA REPORTING AND EXCHANGE REQUIREMENTS AND PROTOCOL

DATA REPORTING AND EXCHANGE

The minimum data required for ISC fishery monitoring and resource assessment fall into three categories:

Category I: total annual catch (round weight by species)
total annual effort (active vessels by fishery)
Category II: catch-effort (summary of logbook data)
Category III: biological data, (size composition, length or weight frequencies, sex information).

CATEGORY I (Total annual catch and total annual effort):

Total annual catch in metric tons (round weight) should be reported by gear, species and country for fisheries in the North Pacific (north of the equator). When established, data should be reported by subarea (see Section 2). If round weight is estimated from processed weight, the conversion procedure is to be noted.

Total nominal effort in numbers of active vessels fishing should be reported by fishery, gear and size category for fisheries in the North Pacific. As with catch, reporting should be done by subarea of the North Pacific. However, if effort cannot be reported by subarea or even for the North Pacific, effort should be reported for a larger area and noted. Vessel size categories to be used in reporting effort are:

Vessels	Size Category
Longline	1. Distant-water and 2. offshore (*Chinese-Taipei*) 1. Distant-water, 2. offshore, and 3. coastal (*Japan*)
Purse seine	1. large (>260 cubic meter capacity; ~300 mt) 2. small (<260 cubic meter capacity; ~300 mt) 1. distant-water and 2. offshore (*Japan*)
Harpoon, handline, Troll, gill net, etc.	aggregated by type

CATEGORY II (Catch-effort):

Catch and effort (logbook) data should be reported by country, gear type, and month. The resolution is as follows:

Gear	By Month	Catch	Effort	Region
Longline	5x5 deg.	.no. or wt.	hooks (all species recorded)	entire Pacific

Purse seine	1x1 deg.*	wt.	days fishing (include searching)	entire Pacific
Troll	1x1 deg.	no.	days fishing (include searching)	North Pacific
Gill net	1x1 deg.	no.	tans or net-days	North Pacific
Harpoon	1x1 deg.	no.	days fishing	North Pacific
Handline	1x1 deg.	no.	no lines	North Pacific
Pole and line	1x1 deg.	no.	no poles/successful days	North Pacific
Other	1x1 deg.	no. or wt.	as needed	North Pacific

*5x5 degree data if 1x1 is not practicable

CATEGORY III (Biological data):

Size composition (length or weight frequencies) and sex data (for swordfish, striped and blue marlins) should be reported by gear type and with the same area resolution as required for Category II data. However, coarser area resolution may be substituted if this requirement can not be applied. Reporting of length-frequencies should be with intervals of 1 or 2 cm. After standard measurements are established (see Section 2, above), both standard measurement and the actual sampling measurement unit should be reported.

All size composition data should include notes on collection method, e.g. port sampled, observer sampled, fisherman sampled, etc. Accuracy of measurement should also be reported (e.g. to the nearest cm, next larger cm, nearest kg, etc.).

DATA ACCESS AND AVAILABILITY

The participants agreed that some extracts from ISC database, that do not contain proprietary information, should be made available to the general public. Category I data aggregated over the entire North Pacific will be considered public domain (PD) data. The PD data will include the caveat that some discards are not reported in the catch statistics provided. Data provided for use and held by the ISC in whatever form remains the property of the individual contributors [1]. Release of these data to the general public may be governed by policies of the contributor.

However, raw Category I data as well as Category II and Category III data contain proprietary information and, therefore, shall be made available to contributors only and to scientists of ISC working groups. Japan will be responsible for managing the central data depository and will designate a control person.

When a request for non-PD data is received from a member of the general public, the data manager will notify and seek approval and conditions from the contributors of the specific data requested prior to release. A record of all requests received from the general public and the disposition of the request will be maintained and reported at each meeting of the ISC Plenary.

Requests for non-PD data by contributors for purposes other than ISC stock assessment activities will be handled by the control person, following the same procedures delineated in the previous paragraph.

1 As used here and throughout this report, "contributors" are all ISC participants who have provided data to ISC for inclusion in its database.

While there is consensus among all contributors regarding the data access rules, outlined above, there is concern that these rules may be changed at some point in the future without the consent of all contributors. It was recommended that the rules not be changed without consensus of all contributors.

Adopted ISC4, February 4, 2004

Appendix 5

Bycatch Working Group – Terms of Reference

The goal of the Bycatch Working Group (BWG) is to assemble data on and where possible assess the status of populations of animals considered to be by-catch species caught by fisheries capturing tuna and tuna-like species in the northern Pacific Ocean. Important objectives will be to assess the interaction between the fisheries and bycatch animals, and as well mitigation measures to reduce bycatch. The initial focus of the BWG will be sea turtles, sea birds, and sharks. Other species will be considered as issues arise and are presented to the BWG by ISC plenary or its working groups. A holistic approach which considers the entire life history of the animal should be taken.

The work of the BWG shall be conducted by collaboration of scientists from member countries, bycatch working groups of international bodies, and other scientists with appropriate credentials and experience in accordance with ISC rules and procedures. The BWG conducts stock assessments on by-catch species where possible, and in support of this research will collect statistics throughout the range of these species. Such data will include catch, effort, size distribution and any other relevant fishery data as well as biological and ecological information concerning the by-catch species.