

## Working Group on the History of Fish and Fisheries (WGHIST)

**2014/MA2/SSGEPI11** The **Working Group on the History of Fish and Fisheries (WGHIST)**, chaired by Ruth Thurstan\*, Australia, and Emily Klein\*, USA, will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
Year 2015	19-23 October	Ispra, Italy	Interim report by 1 December to SSGEPI	
Year 2016			Interim report by	
Year 2017			Final report by	

## ToR descriptors

T O R	DESCRIPTION	BACKGROUND	SCIENCE PLAN TOPICS ADDRESSED	DURATION	EXPECTED DELIVERABLES
a	Use case studies to demonstrate the tangible benefit of marine historical ecology to current marine policy and management	WGHIST offers a unique forum for common work on social-ecological change through time from different geographic regions as well as thematic areas and across disciplines. Case studies drawing from this diverse group clarify by example the value and use of historical understanding of linked human and ecological systems through time, and the application of that understanding to contemporary study and management. In addition, by explaining case studies, their context, methodological approach, analysis, use of results and strategies for dissemination and outreach, working group participants	The ICES Strategic Plan identifies two goals under its Science pillar: 1) Develop an integrated, interdisciplinary understanding of the structure, dynamics, and the resilience and response of marine ecosystems to change; 2) Understand the relationship between human activities and marine ecosystems, estimate pressures and impacts, and develop science-based, sustainable pathways.  Both of these goals require information on the structure and functioning of marine ecosystems and the human communities that have relied upon these systems through time. Past systems provide key baselines and are a critical benchmark for measuring changes in populations, species relationships, and ecosystem structure through time. This informs 1) perspectives about the health and sustainability of resources today; 2) the propensity, direction, and speed of response to perturbation; and 3) the resilience of ecosystems to perturbation through time. Historical insights such as those from WGHIST and its participants are critical for understanding the	All years, culminating in Year 3.	Abstract submitted to ICES annual conference (2016 and/or 2017). Summary report to ICES. Manuscript to a peer-reviewed scientific journal.

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have the opportunity to exchange research approaches, thus learning best practices for continued work and its application from one another.

current resilience of ecosystems and how they may change in the future, and are significant for informing contemporary management approaches, such as Integrated Ecosystem Assessments (IEA). In addition to informing these overarching goals, WGHIST aids several objectives of the EPD element of the ICES Science Plan. For example, WGHIST will address at least one case study in detail over the next three years to describe and quantify the state of a North Atlantic Ocean system. Understanding the response of ecosystems to perturbation can inform how we might expect ecosystems to react to climate change and human impacts in the future. Historical work has particular potential to discriminate between climate and human influence given its long-term perspective that includes periods of substantial human pressure prior to more recent climate change. Our case study will provide an avenue for this assessment. More generally, using a case study for these aims will also provide in-depth understanding of how historical work can be made directly accessible and useful to specific management and research institutions.

Furthermore, one of the objectives of the EPI element of the Science Plan specifically states, "Estimate long-term trends of human impacts on marine ecosystems". WGHIST will directly address this topic by drawing together existing and continuing research on long-term trends and summarizing their significance and potential application to contemporary management. In addition, WGHIST's focus case study will highlight the process of developing historical baselines of population and community structure and production for a North Atlantic region, and their use as reference points for this system. WGHIST will also examine methods (either using indicators or measures of relative change) that have been used to quantify direct and indirect impacts from fisheries and

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			<p>other anthropogenic activities, as per the 2<sup>nd</sup> objective of the EPI element. Finally, WGHIST will contribute to the IEA element of the Science Plan. In addition to providing novel insight into ecosystem structure and change, WGHIST is uniquely poised to aid this element due to its cross-disciplinary nature. WGHIST participants routinely address disparate and non-traditional data sources, and can therefore aid in advancing novel methodologies and approaches that link quantitative and qualitative methods at appropriate spatial and temporal scales.</p>		
b	<p>Ensure that quality-assured historical metadata are accessible to the science community to stimulate data products including digital applications</p>	<p>Data from WGHIST supports the development of tools for marine living resource management and provides data to the global community via the ICES Data Centre and DIG.</p>	<p>Making historical data and metadata descriptions openly available allows others to perform a range of possible analyses, especially with respect to historical baselines and change through time. WGHIST will continue to provide data to support assessment of historical reference conditions and natural variations in marine ecosystems, which can be used as baselines for evaluation of current ecosystem health. This also fulfills ICES goals under their Data &amp; Information Plan. WGHIST supplies novel data and information resources, and will pay particular attention to their promotion and use through conversations with other ICES working groups, the Data and Information Group and ICES Data Centre (Year 2). WGHIST will also work to integrate WGHIST resources into ICES current digital information approaches (Year 2).</p>	All years	<p>Integration of historical data into existing ICES Data Portal. Metadata descriptions to be made available through ICES Metadata Catalogue and ICES Data Portal (updated annual metadata file).</p>
c	<p>Integrate historical data sources through both state-of-the-art and non-traditional methodologies, to improve our current knowledge base on long-term changes</p>	<p>Science: Analysis of deviations in current population and community levels needs historical data to demonstrate conditions under pre-industrial exploitation levels. WGHIST can provide some of these historical baselines. Advisory: Increasingly, national legislation requires historical baselines for</p>	<p>The ICES Science Plan states four supporting activities that will enable the achievement of the science goals. Under this ToR, WGHIST will contribute to two of these in particular: (1) Providing tools and methods for assessing relationships between marine ecosystems, their biological resources, and the provision of services to society, including socio-economic aspects; (2) Developing integrated ecosystem assessment methodologies and approaches that allow the use of both</p>	Year 3	<p>Manuscript to a peer-reviewed scientific journal.</p>

current ecosystem approaches. WGHIST can provide the data and analysis to meet some of these demands.

Other WGs: Groups such as WGECO should find good use in the data and particularly analysis coming from WGHIST to establish historical levels for population and ecosystem phenomena.

qualitative and quantitative data, and which can be used to address both specific advisory questions and broader ecosystem issues;

To (1) above, WGHIST is particularly able to aid in delivering tools and methods for broader understanding of ecosystems and ecosystem services. Members of WGHIST commonly work with less than conventional sources, and are thus well versed in using interdisciplinary methods to extract non-traditional data and interpret trends over long (decadal to centennial) periods of time. This provides ICES with a wealth of unique interdisciplinary skills for assessing relationships (past and present) between marine ecosystems and society. In summarizing existing marine historical ecology research and via the case study, WGHIST will highlight these tools and methods and their further applicability to research more broadly. The case study in particular will focus on using unique data and approaches for deeper understanding and informed management advice.

As per (2) above, ICES WGHIST participants regularly work with both qualitative and quantitative data sets, and thus have the appropriate expertise in drawing on a wide range of data to answer for inquiry. This includes developing innovative solutions to address data gaps relating to broad ecosystem issues, and particularly, interactions between humans and the marine environment.

d	Address social, cultural and economic dimensions of marine ecosystem products and services through time with the aim to contribute to integrated ecosystem	WGHIST supports the existing indicators and assessments used in coastal and marine policies, including descriptors of GES as identified by EU member states. These include human dimensions and disciplines beyond ecology and fisheries science. WGHIST is	The ICES Science Plan states, "Achieving integrated ecosystem understanding requires an interdisciplinary approach including the detailed knowledge of the structure and functioning of marine ecosystems [...], they are best assessed when observing the entire ecosystem including human activities". Further, EDP and especially the EDI elements of the Science Plan specifically discuss the need to understand impacts and	All years	Summary report to ICES.  Manuscript to a peer-reviewed scientific journal.
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assessments	<p>by nature multi-disciplinary: research and hypotheses may range from informing territorial and economic regeneration policies to supporting of the Marine Strategy and other environmental policies. In terms of the MSFD, WGHIST focuses mainly on topics related to descriptors 1-6. WGHIST acknowledges the formal context in which indicators of GES are developed and reported within the EU. However, WGHIST has a wider geographical scope than EU, and contributors and members come from outside the EU: e.g. USA, South Africa, and Australia, thus supplying global insight.</p>	<p>feedbacks between reliant human communities and ecological systems. WGHIST comprises experts from multiple disciplines, with a particular reference to 1) the nature of interactions of humans with marine ecosystems, and 2) the response of ecosystems to these interactions. Only by assessing the structure, functioning and productivity of historical environments can we deduce when and to what extent change has occurred, especially for elucidating between human impacts and climate change. Without this baseline, we cannot accurately measure the resilience and response of marine ecosystems to perturbation (the fundamental aim of the EPD element). Through cross-disciplinary work, WGHIST can study insight regarding feedbacks with human communities. In particular under this ToR, WGHIST will enhance connections with social science, economics, and policy via special sessions and specific deliverables. These outputs will contribute towards indicators of state and function of coupled social-ecological systems required to develop IEAs and management advice (ICES Plan p.11).</p>
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## Summary of the Work Plan

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Year 1

The priority for Year 1 will be to 1) summarize potential and actual approaches and challenges to the application of historical marine ecology for contemporary science and management via case studies of work within WGHIST (already initiated by manuscript in prep from WGHIST 2011-2014); and 2) highlight the process of accessing and applying historical data to science and management questions by identifying one (potentially two) regional-level North Atlantic case studies where historical data (both quantitative and qualitative) has already been developed and analyzed for results readily applicable to ICES Science Plan objectives (see ToR(a) above).

In addition, the WGHIST 2015 meeting will include a Special Session on Human Dimensions, focusing on interactions of human communities with marine ecosystems through time. Participants will be invited to discuss work on how people interact with and react to marine ecosystems in terms of sociology, economics/markets, and law/policy. This session will strengthen WGHIST cross-disciplinary ties and emphasize the human dimensions of marine system change and resilience.

During the following year, the Chairs (with the help from WGHIST participants) will identify potential participants from management and policy spheres (e.g. ICES WGs, ACOM, ICES Secretariat) interested and able to contribute in following sessions towards the application of historical data gathered through these case studies.

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Year 2

Year 2 will focus on the inclusion of participants from management and policy spheres to identify areas where historical data can be explicitly incorporated into the decision-making process, and how to overcome potential challenges to doing so (identified in Year 1). The inclusion of participants outside of WGHIST will be effected by linking with members of other ICES WGs within SSGEPD, SSGEPI and SSGIEA, as well as experts outside ICES (e.g., stock assessment modellers, lawyers and policy experts from ICES member states). Potential participants will be approached by the Chairs prior to the Year 2 meeting. To ensure tangible outputs from this meeting, WGHIST will concentrate on the case study identified during the previous year, although WGHIST participants will be encouraged to bring their research forward for discussion as well.

In Year 2, WGHIST will also hold follow-up discussions on the Special Session on Human Dimensions (Year 1) into meetings with the larger group, to demonstrate available socio-economic data through time and encourage cross-disciplinary conversations within ICES and with external groups, such as the EU COST Oceans Past Platform (OPP).

Finally, WGHIST will meet with Data Centre and DIS staff to update the existing WGHIST metadata, ensure its availability in the ICES portal, and discuss digital applications of this work. WGHIST information may be readily included in current ICES products, for example as maps of historical species distributions and abundances, or as background information in the Popular Advice Data Portal.

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Year 3

Year 3 will draw together the findings from the WGHIST and participants from broader management/policy spheres. We will present a detailed report on how historical data could be explicitly incorporated into current management frameworks (e.g., IEA), drawing on experience from the North Atlantic case study, and will also present recommendations for how future decision-making frameworks could be set up to maximise the use of historical data. This will also include summaries and output (ICES Reports on available socioeconomic and policy data, peer-reviewed summaries) from the Special Sessions on Human Dimensions. The WGHIST experience will be summarized in peer reviewed publications. WGHIST will also complete all data products developed in Year 2 with ICES Data Centre and DIS.

Finally, WGHIST will perform a self evaluation and solicit recommendations from participants, to be included in the final report.

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## Supporting information

Priority	<p>The value of historical marine ecology for evaluating current ecosystem health and providing appropriate baselines is now well published. In addition, understanding social-ecological system change has great potential for better understanding how the resilience of these systems and how they may change in the future. However, even as the literature on marine social-ecological systems through time continues to grow, its application to contemporary science and management questions has lagged despite demonstrated needs. This iteration of WGHIST will focus on the best practices and challenges to this application via research done by WGHIST participants and a detailed case study.</p> <p>Scientific Scope: WGHIST 2015-2017 will focus on operationalizing historical data for current scientific questions and management needs by addressing case studies, and engaging these in management and policy frameworks. Following this process from start to finish, and providing peer-reviewed manuscripts as deliverables, will ensure an improved understanding of why historical data has not been addressed despite its well-published importance, detail challenges to its implementation, and highlight ways in which the field can move forward. In addition, by also focusing on change in linked social-ecological systems, WGHIST participants will develop cross-disciplinary work and approaches during the process. Finally, ensuring data availability and working with DIS staff for digital products will provide a secondary avenue for the wider use of WGHIST data to the ICES community and beyond, presenting a unique perspective on the wealth of data already available via ICES data portals and products.</p>
Justification of venue 2015 (in a non-ICES Member Country)	<p>All WGHIST meetings will take place in Member Countries. We are also aiming to enhance connections with the newly determined OPP. This international initiative was recently developed via EU COST funding. WGHIST has significant overlap in participants and research objectives with OPP, yet is unique in its connection with ICES and potential to answer the application needs already described above. Consequently, collaboration with OPP is mutually beneficial to both groups and ICES in terms of connecting research and initiating new work in the EU and neighboring countries. In Year 2 WGHIST will be held in Copenhagen to facilitate linkages with ICES staff and other WGs, as described in our Year 2 work plan.</p>
Resource requirements	<p>WGHIST will continue consultation with ICES Data Centre staff, especially as we continue data products discussed in our meeting in 2014. Future staff attendance will be an asset to WGHIST especially in 2016. In addition, WGHIST co-chairs will be contacting additional ICES staff and Working Group participants to discuss their interest and ability to attend in 2016.</p>
Participants	<p>WGHIST predicts attendance by 10-15 group members and guests. These will include ecologists, historians, social scientists, economists, policy experts, data analysts working in or connected to historical marine ecology. In addition, we will invite guests in contemporary management and policy, who may participate remotely.</p>
Secretariat facilities	<p>None in 2015. Meeting rooms and ability for participants to access the meeting remotely in 2016. 2017 is uncertain at this time.</p>
Financial	<p>No financial implications</p>
Linkages to ACOM and groups under ACOM	<p>WGHIST will actively seek out connections within ACOM for the application of historical ecology work into scientific advice (e.g. stock baselines, change through time, context for IEAs, etc).</p>
Linkages to other committees or groups	<p>Potential links to ACOM, SSGEPD, SSGEPI, SSGIEA as well as SICCME, SISAM, WGBIODIV, WGBFAS, WGECO, WGMARS, WGMIXFISH, WGRMES, WGSAM, DIG, PGDATA, WGRECORDS, depending on interest and availability of committee and group members to join in person or remotely.</p>
Linkages to other organizations	<p>There is interest for the European Commission in regards to MSFD baseline development as well as Integrated Ecosystem Assessments. Participants in the Ocean Past Initiative will also be interested in our work and outcomes, and WGHIST will promote connections with this group. Finally, WGHIST has an international participation beyond ICES member countries, including Australia, South Africa and Italy.</p>

