



## Too Big to Ignore (TBTI) Working Group 1 (WG1) Workshop

### A summary report<sup>1</sup>

#### Introduction

The primary goal of TBTI WG1 as stated in the original project proposal is “to define and develop an information system suitable for capturing the key parameters of small-scale fisheries, and for undertaking multi-level and multi-scale analysis of their contributions.” This information system has been dubbed the Information System for Small-scale Fisheries (ISSF). While design of ISSF is the responsibility of the core WG 1 team members, which currently consists of Working Group 1 Leader (Rodolphe Devillers) and Senior Information Systems Analyst (Randal Greene), supported by Easkey Britton (TBTI post-doctoral fellow) and Ratana Chuenpagdee (TBTI project director), requirements input must come from a broad constituent base, including WG1 members, WG leaders and TBTI members at large.

A WG1 workshop focusing on ISSF design was held at University of British Columbia (UBC), June 16-17, 2013. The 19 participants are listed in Appendix I. Workshop activities included:

- Reviewing the original ISSF vision and describing the proposed process for refining it.
- Receiving input from workshop participants in the form of presentations on related topics and structured group discussions.
- Describing and expanding an initial set of high-level requirements, including a draft data model, developed by the project team based on earlier communications.
- Continuing the process, begun earlier through an online survey, of identifying and refining key attributes that help profile small-scale fisheries (SSF).
- Reviewing and discussing ISSF technology options based on examples of existing, working systems.
- Deciding on 18-month priorities for WG1, including a tentative ISSF rollout schedule and WG1 coordination of and participation in publications, conferences and meeting.

WG1 also participated on June 15 in a “synergy day”, which was the final day of the Fishing Futures and TBTI NAM/WG5 workshop. This was an opportunity to provide information to

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<sup>1</sup> Prepared by Randal Greene (rgreene@mun.ca) and Rodolphe Devillers

and get input from a broader group of stakeholders. Synergy day details will be available in a separate report for that workshop.

### **Member/Partner Presentations**

Powerpoint files for each of these presentations is available to workshop participants in the WG1 Workshop dropbox, or by request to WG1 leader Rodolphe Devillers (rdeville@mun.ca).

#### William Cheung – Climate change effects on the distribution of global fish stocks

Evidence has been gathered in some places in the world regarding the impact of climate change on specific fisheries. The approach described correlates the rate of change of Sea Surface Temperature with the rate of change of the Mean Temperature of Catch, while also taking into account fishing effort and large-scale oceanographic effects. The approach can be extended to project future species distribution, composition and potential catch.

#### Dirk Zeller – Reconstruction of historical fisheries catches: update

The *Sea Around Us* Project has developed a global database on fisheries and the world's marine ecosystems. Its current effort is to reconstruct catch for every country along an extended time series, to account for SSF catches, among other things, which are mostly under-represented in the existing data collection system. Lessons from this project potentially applicable to TBTI/ISSF include:

- Starting flat (a small number of useful and available key attributes) and wide (covering every possible country).
- Making the results globally searchable (i.e. pay attention to Google ranking).
- Quantifying, generalizing and scaling up to country level wherever possible to have maximum impact on policy makers.

#### Rebecca Lewison – Building global databases: bycatch and fishing effort, top down and bottom up

Project Global assesses the impact of fisheries bycatch on marine mammals, seabirds and sea turtles worldwide. Existing evidence suggests bycatch from SSF can have substantial impacts on sensitive species, while also providing a measure of coastal ecosystem integrity. Given that bycatch is more a function of effort than of catch, a Fishing Effort Envelope Tool was developed to help make a top-down estimate of the number of boat meters per square kilometer. Population size and size of fishing ground were found to be the key drivers of fishing effort intensity, and showed how the tool is useful to help characterize patterns of human-ecological linkage. The Project is also undertaking a bottom-up approach based on interviews.

Tara Whitty – Small-scale & Artisanal Fisheries Research Network (SAFRN)

SAFRN is an interdisciplinary hub of students, researchers, and faculty, based in San Diego, studying SSF with a goal of enhancing communication and reducing redundancy in SSF research. One of SAFRN’s key tools is a Snapshot Assessment Protocol, including a survey template, which has close synergy with ISSF. SAFRN is also involved with a National Science Foundation proposal, which would conduct a number of studies with local partners and feed relevant outputs back to TBTI/ISSF.

Paul Boudreau – Coastal and Ocean Information Network – Atlantic (COINAtlantic)

COINAtlantic has developed a Geocontent Generator and Search Utility that guide the creation of searchable metadata and a study area polygon to help organizations publicize their geospatial data. Some aspects of COINAtlantic’s approach and some of their lessons learned may be applicable to TBTI/ISSF:

- Avoiding as much as possible the need to data suck and hold copies of data that are managed/stored elsewhere.
- Having a simplistic search mechanism that Google and other search engines can easily index (COINAtlantic uses KML which has the advantage of being text-based while also containing georeferenced data such as study area polygons).

**High-level Requirements and Technology Examples**



The figure above illustrates some of the key high-level requirements for ISSF, loosely organized from left to right by firmness. It was used as a starting point for a discussion of prioritizing ISSF requirements. One of the approaches to thinking about high-level requirements was a demonstration and discussion of existing technology. The technology examples are in Appendix II and the results of the requirement prioritization exercise are in Appendix III.

### **Key Attributes**

A major focus of the workshop was deliberation on Key Attributes, which will be used to define the structure of the SSF Profile within the ISSF database. Prior to the workshop, round 1 of an Attribute Survey was conducted. It concentrated on attribute importance, and the results are presented in Appendix IV.

As part of the attribute refinement process, discussion of Analysis Scenarios was held. Participants suggested scenarios within their fields of expertise, and then considered which of the currently proposed attributes would support the analysis, or which additional attributes may be needed. Suggested Analysis Scenarios are provided in Appendix V.

Group discussions at the workshop also focused on data availability and attribute refinement, including clarifying attribute meaning and suggesting appropriate data types. These discussions will be used to help structure additional rounds of the Attribute Survey.

### **Next Steps**

The workshop ended with an open discussion of next steps for WG1. Key outputs are listed in Appendix VI (WG1 Priorities), Appendix VII (Conferences and Meetings) and Appendix VIII (ISSF Rollout Phases). It was decided that immediate priorities would be to continue stakeholder data collection, the key attribute survey and partner technical investigations.

### **Acknowledgments**

The workshop was generously hosted by the University of British Columbia Fisheries Centre. Video recording was provided by Neil Ladell, TBTI PhD student linked to WG5, of Simon Fraser University.

## Appendices

### Appendix I: Workshop Participants

| Name               | Institution  | E-mail   |
|--------------------|--|--|
| Eric Angel         | Simon Fraser University, Canada  | <a href="mailto:eangel@sfu.ca">eangel@sfu.ca</a>                                   |
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| Tara Whitty        | Scripps Institution of Oceanography, University of California San Diego, USA | <a href="mailto:tara.whitty@gmail.com">tara.whitty@gmail.com</a>                   |
| Dirk Zeller        | Sea Around Us, University of British Columbia, Canada                        | <a href="mailto:d.zeller@fisheries.ubc.ca">d.zeller@fisheries.ubc.ca</a>           |

## Appendix II: Technology Examples

| Technology                          | Site  | Comments   |
|-------------------------------------|---|--|
| Map-based navigation/presentation   |   | Typically quantitative, but could provide drill-down to all kinds of detail...   |
|                                     | * <a href="http://earthpulse.nationalgeographic.com/earthpulse/earthpulse-map">http://earthpulse.nationalgeographic.com/earthpulse/earthpulse-map</a> | Typical, comparison of 2 maps, sometimes done with swipe instead of transparency   |
|                                     | * <a href="http://www.statsilk.com/maps/statplanet-world-bank-app-open-data/">http://www.statsilk.com/maps/statplanet-world-bank-app-open-data/</a>   | Typical, linked panels with brushing (geovisualization), defined and flexible regions, time series using slider          |
|                                     | * <a href="http://www.protectedplanet.net/">http://www.protectedplanet.net/</a>   | Drill-down to text and photos of each protected area   |
|                                     | <a href="https://www.movebank.org/">https://www.movebank.org/</a>   | Point-based with user contribution   |
|                                     | <a href="http://map.stjohns.ca/mapcentre/mapcentre.html">http://map.stjohns.ca/mapcentre/mapcentre.html</a>   | Web-based GIS interface  |
|                                     | <a href="http://www.seasketch.org/">http://www.seasketch.org/</a>   | Sketching, analysis, collaboration   |
|                                     | <a href="http://maps.waterdata.usgs.gov">http://maps.waterdata.usgs.gov</a>   | Web-based GIS interface  |
|                                     | <a href="http://geonetwork.fao.org/geonetwork/srv/en/main.home">http://geonetwork.fao.org/geonetwork/srv/en/main.home</a>                             | Various thematic maps presented in web-based GIS interface   |
|                                     | <a href="http://databasin.org/">http://databasin.org/</a>   | Conservation GIS data publishing for anyone and sharing for other GIS users; free/public and paid/professional versions  |
|                                     | <a href="http://www.arcgis.com/about/">http://www.arcgis.com/about/</a>   | GIS data publishing for anyone and sharing for other GIS users; free/public and paid/professional versions               |
|                                     | <a href="http://www.app.collinsindicate.com/worldbankatlas-global/en-us">http://www.app.collinsindicate.com/worldbankatlas-global/en-us</a>           | Country indicators, linked tables and graphs, user import for other indicators   |
|                                     | <a href="http://maps.worldbank.org/">http://maps.worldbank.org/</a>   | WB projects with details drilldown   |
|                                     | <a href="https://maps.google.com/">https://maps.google.com/</a>   |  |
|                                     | <a href="http://www.iucnredlist.org/">http://www.iucnredlist.org/</a>   |  |
| Query-based navigation/presentation |   |  |
|                                     | * <a href="http://www.fishbase.org/search.php">http://www.fishbase.org/search.php</a>   | Classic database query operators (not full-text)   |
|                                     | * <a href="http://www.searoundus.org/">http://www.searoundus.org/</a>   | Some map-based selection and display, mostly quantitative data, some links to external collaborators (see EEZ, Treaties) |
|                                     | <a href="http://www.mpaglobal.org/home.html">http://www.mpaglobal.org/home.html</a>   | Text-based queries of data by country, multiple predefined region types, column sorting, drill-down to raw data          |
|                                     | <a href="http://www.wiofish.org/">http://www.wiofish.org/</a>   | Country/fishery profiles of SSF  |
| Hyper-linked based                  |   |  |
|                                     | * <a href="http://en.wikipedia.org">http://en.wikipedia.org</a>   | Classic contribution wiki, but very link oriented  |
|                                     | * <a href="http://coinatlantic.ca/index.php">http://coinatlantic.ca/index.php</a>   | Tells a succinct, coordinated story with links to authoritative sources for details and related information              |
| Interactive community               |   |  |
|                                     | * <a href="http://forums.arcgis.com/forums/214-ArcGIS-10.1-for-Server-General">http://forums.arcgis.com/forums/214-ArcGIS-10.1-for-Server-General</a> | Classic post/reply forums  |
|                                     | * <a href="http://spatiallyadjusted.com/">http://spatiallyadjusted.com/</a>   | Classic blog with public comments  |
|                                     | <a href="http://linkedin.com">http://linkedin.com</a>   | Professional network   |
| Information contribution            |   |  |
|                                     | * <a href="http://en.wikipedia.org">http://en.wikipedia.org</a>   | Full wiki where anyone can contribute  |
|                                     | <a href="http://www.landscapecollaborative.org">http://www.landscapecollaborative.org</a>   | Full wiki where only registered/approved users contribute  |
|                                     | * <a href="https://www.movebank.org/">https://www.movebank.org/</a>   | Point-based with user contribution   |
|                                     | <a href="http://www.openstreetmap.org/">http://www.openstreetmap.org/</a>   | Contribute all streetmap elements  |

### Appendix III: ISSF High-level Requirements

| Requirement (approximately ordered by firmness)               | Comment  | Action  | Status              |
|---|--|---|---------------------|
| Helps improve profile of SSF                                  | Motherhood statement   |   | Required            |
| Support researchers   | Motherhood statement   |   | Required            |
| Web-based   | Motherhood statement   |   | Required            |
| Geographic  | Not georeferencing of exact coordinate   | Refine flexible "location" attribute  | Required            |
| Map/GIS user interface  |  | Determin to which components this would apply...                            | Required            |
| Maintains a database of small-scale fishery:                  |  | Work through design details   | Required            |
| key attributes/characteristics (ssf profile)                  | Designed from Key Attributes survey; populated from ongoing contributions  |   |                     |
| case studies (unstructured)                                   | Populated from ongoing semi-structured contributions   |   |                     |
| Maintains a database of small-scale fishery stakeholders:     |  |   |                     |
| researchers   | Populated from Who's Who survey and TBTI member and collaborator profiles  |   |                     |
| knowledge   | Populated from State-of-the-art survey   |   |                     |
| research priorities   | Populated from Top 100 survey  |   |                     |
| experience  | Populated from Fishers Wisdom and Experience survey  |   |                     |
| organizations   | Populated from Organization survey and TBTI partner profiles   |   |                     |
| capacity needs  | Populated from Capacity Development and Training Needs survey  |   |                     |
| data sources  | Suggested metadata catalog   |   |                     |
| projects  | Suggested to help profile SSF; include failures  |   |                     |
| Receives data in multiple formats:                            | Which formats are required?  | Determine priority  | Required            |
| hard-copy   |  |   |                     |
| online form/survey  |  |   |                     |
| mobile form/survey  |  |   |                     |
| electronic batch feed   |  |   |                     |
| electronic real-time feed                                     |  |   |                     |
| Supports delivery of online training (DELTS)                  | Which topics delivered using what tools?   | Coordinate with WG7   | Required            |
| Provides free and open access to data                         | No licenses, install, login  |   | Required            |
| Only accept unrestricted data                                 | Enables previous point without special security  |   | Required            |
| Accepts metadata related to restricted data                   | Facilitates contacting authoritative source  |   | High priority       |
| Provides TBTI-standard metadata template                      | Determine optional and required  | Base on FGDC/ISO?   |                     |
| Supports policy makers  | Directly related to improving profile of SSF   |   | High priority       |
| Supports communities (non-scientists)                         |  | Some overlap with WG7   |                     |
| Technically accessible  | Old browsers, low bandwidth  | Determine if separate low-bandwidth version needed                          | High priority       |
| Handle absence of data  | For instance, zero versus unknown quantitative data  | Consider how to handle in qualitative data                                  | High priority       |
| Temporal  | SSF Profile records would typically be for a particular year, but could be flexible to handle other time frames such as ranges and seasons | Refine flexible "time" attribute  | Under consideration |
| Accepts contributions from identified, authentic sources only | Not live until validated   | Decide if unsolicited public contributions are acceptable for some datasets | Under consideration |
| Exports data  | See formats above under "receives"   |   | Under consideration |
| KML version for Google users                                  | Solution for low-bandwidth?  |   | Under consideration |
| Provides information about TBTI network                       | Migrate current intranet to new web platform and make incremental improvements?  |   | Under consideration |
| Provides real-time feed                                       |  | What data for what types of users   | Low priority        |
| Supports disconnected users                                   |  | What data for what types of users   | Low priority        |
| Delivered on mobile/handheld devices                          | All datasets? Special version of site?   |   | Low priority        |
| Links to authoritative sources                                | References information but links to original source site for details in order to minimize duplication (COINAtlantic model)                 | Determine to which parts of design this may apply...                        | Under consideration |
| Multi-lingual   | Consider translated content with French and Spanish as leading candidates  | Investigate/estimate technical mechanism                                    | Under consideration |
| Multi-lingual   | Consider just translating surveys as a fallback or initial step  | Rodolphe and Ratana to consider volunteers                                  | Under consideration |
| Provides interactive online community                         | Are blogs, forums, wikis, comments and other intra-group tools central to ISSF?  | Use existing communities; don't reinvent wheel                              | Under consideration |

## Appendix IV: Attribute Survey Round 1 Results

| Category                            | Possible Attribute   | Mean Importance Rating (out of 4) | Standard Deviation |
|-------------------------------------|--|-----------------------------------|--------------------|
| General                             | Fishing effort   | 3.54                              | 0.67               |
|                                     | Structure of SSF unit  | 3.41                              | 0.90               |
|                                     | SSF gear type  | 3.33                              | 0.80               |
|                                     | Number of SSF vessels  | 3.26                              | 0.84               |
|                                     | SSF definition   | 3.15                              | 1.08               |
|                                     | SSF vessel type  | 3.05                              | 0.96               |
|                                     | Average length of SSF vessel   | 2.28                              | 1.01               |
| Economic                            | Market chain for SSF   | 3.33                              | 0.88               |
|                                     | Volume of landings   | 3.33                              | 0.94               |
|                                     | Value of landings  | 3.25                              | 0.95               |
|                                     | Income of SSF unit   | 3.11                              | 0.87               |
|                                     | Existence of SSF subsidies   | 3.06                              | 0.97               |
|                                     | Designated SSF area  | 2.97                              | 1.01               |
|                                     | SSF GDP  | 2.86                              | 1.03               |
|                                     | Government expenditure on SSF  | 2.86                              | 1.03               |
|                                     | Total government expenditures of fisheries                                     | 2.81                              | 0.99               |
|                                     | Total fisheries GDP  | 2.78                              | 0.97               |
|                                     | Value of SSF unit  | 2.78                              | 1.11               |
|                                     | Product valorization   | 2.58                              | 0.59               |
|                                     | Ecological   | Impact of SSF on stock            | 3.50               |
| Impact of SSF on habitat            |  | 3.42                              | 0.92               |
| Amount of bycatch                   |  | 3.33                              | 1.00               |
| Marine Protected Area / SSF overlap |  | 3.14                              | 0.92               |
| Number of species targeted by SSF   |  | 3.11                              | 0.97               |
| Habitat type                        |  | 3.08                              | 0.79               |
| Marine Trophic Level (MTL)          |  | 2.61                              | 1.19               |
| Social                              | Employment in SSF harvesting   | 3.50                              | 0.93               |
|                                     | Dependence on fisheries as primary income                                      | 3.50                              | 0.93               |
|                                     | Employment in SSF processing   | 3.36                              | 0.98               |
|                                     | Income level   | 3.36                              | 0.98               |
|                                     | Other sources of income  | 3.28                              | 1.04               |
|                                     | Employment in all fisheries  | 3.19                              | 1.05               |
|                                     | Level of fish consumption  | 3.14                              | 1.11               |
|                                     | Employment type  | 3.14                              | 1.13               |
|                                     | Life satisfaction of SS fishers  | 3.00                              | 1.13               |
|                                     | Gender ratio of SSF fishers in processing/marketing                            | 2.92                              | 1.09               |
|                                     | Gender ratio of SS fishers in harvesting                                       | 2.86                              | 1.16               |
|                                     | Labour mobility  | 2.81                              | 1.13               |
|                                     | Age profile of SS fishers  | 2.81                              | 1.22               |
|                                     | Social assets of SSF   | 2.78                              | 1.18               |
|                                     | Occupational health and safety   | 2.75                              | 1.16               |
| Experience profile of SS fishers    | 2.69   | 1.13                              |                    |
| SSF community issues                | 2.53   | 1.24                              |                    |
| Governance                          | Level and scale of involvement of SS fishers in fisheries management           | 3.75                              | 0.49               |
|                                     | Policy support and/or legal framework for SSF                                  | 3.61                              | 0.83               |
|                                     | Customary or informal management systems                                       | 3.44                              | 0.96               |
|                                     | Dominant property regime   | 3.42                              | 0.98               |
|                                     | Conflict(s) with other sectors, marine-resource users and/or marine activities | 3.39                              | 0.89               |
|                                     | Dominant governance mode in SSF  | 3.39                              | 1.01               |
|                                     | Level of compliance with rules and regulations                                 | 3.25                              | 1.01               |
|                                     | Science-SSF partnerships   | 3.06                              | 1.13               |

## Appendix V: Analysis Scenarios

Following is a preliminary list that is being expanded in consultation with working group leaders:

|   |
|---|
| SSF market chain (WG2)  |
| Vulnerability to change (WG2)   |
| The 'meaning' of fish (WG3)   |
| Interactions of SSF with others in the area (WG3)                       |
| Environmental knowledge, conservation and stewardship (WG4)             |
| Gear interaction and bycatch/discards (WG4)                             |
| Understanding of local ownership and entitlements (WG5)                 |
| Comparison of different property right regimes in SSF (WG5)             |
| Performance criteria for SSF governance (WG6)                           |
| Images, principles and governance mismatch (WG6)                        |
| Problems, challenges and opportunities in SSF (WG2/WG5)                 |
| Definitions and common characteristics of SSF around the world (Global) |
| Comparison between SSF vs. LSF (similar to Pauly's table) (Global)      |
| Who fish? (Global)  |

## Appendix VI: WG1 Priorities

| Activity   | Details   | Target Date |
|--|---|-------------|
| Information about SSF Stakeholders                               |   |             |
| Continue stakeholders data collection                            | Researchers first                                     | End 2013    |
| Prototype display of stakeholder data                            | Map-based   | Winter 2014 |
| Information about SSF  |   |             |
| "Finalize" SSF Profile (attributes)                              | Next step is attribute importance survey round 2      | Fall 2013   |
| Prototype "local" input with selected members                    | Danielle Edwards, Tara Whitty (SNAP assessment), etc. | End 2013    |
| Prototype SSF Case Study (unstructured multimedia)               |   | Winter 2014 |
| Determine how to incorporate existing databases into SSF Profile |   | Winter 2014 |
| Populate SSF Profile from existing databases                     |   | Spring 2014 |
| Prototype display of SSF Profile                                 |   | Fall 2014   |
| Other WG1 member engagement                                      |   |             |
| Continue partner technical investigations                        | iMarine, CREAT, COINAtlantic, SeaSketch, etc.         | Ongoing     |
| Engage WG1 members who could not attend Vancouver                |   | Ongoing     |
| WG1 workshop   | See Conferences and Meetings tab for additional       | Feb 2014    |

## Appendix VII: Conferences and Meetings

| Event                                       | Date                    | Activity                                   |
|---|-------------------------|--|
| Asia/WG3 Meeting (Hyderabad)                | Dec 10-12, 2013         | 10th-12th; include PSC and WG1 discussions |
| WG1 Meeting (Tiburon)                       | Week of Feb 15-19, 2014 | WG1 workshop                               |
| Coastal Zone Canada (Halifax)               | Jun 2014                | ISSF Prototype workshop                    |
| Society for Conservation Biology (Malaysia) | Aug 2014                | ISSF Prototype workshop?                   |
| Merida                                      | Sep 2014                | ISSF Launch                                |
| CoastGIS (Cape Town)                        | Jun 2015                | ISSF Additional Features Launch            |

## Appendix VIII: ISSF Rollout Phases

| Phase | Target Date         | Scope   |
|-------|---------------------|---|
| 1     | May 2013            | toobigtoignore.net update<br>Simplified home page<br>Allow non-web staff to control News  |
| 2     | Fall/Winter 2013/14 | Information about SSF stakeholders and TBTI network<br>Prototype map-based display of stakeholder data<br>Prototype SSF Case Study (unstructured multimedia)<br>Improve usability of members intranet<br>Optionally push intranet content to public web site<br>Change overall technology platform if appropriate |
| 3     | Summer/Fall 2014    | Information about SSF<br>Prototype navigating/reporting of SSF Profile records using map-based interface<br>Implement high-priority requirements first<br>Launch at 2nd WSFC in Merida  |