Supplementary Material #1 - An initial ‘scoping framework’ was developed from a scan of Canadian policies and international literature and deliberations of the CFRN project 1.1 team culminating at the Halifax meeting in April 2012.

### Project 1.1 Framework, Relevant Canadian Policies and Indicators

**Purpose:** To articulate a common, practical view of criteria for a sustainable fishery system, anticipated from Canadian policy documents, including ecological, social, economic and institutional aspects so as to provide a common framework for a more comprehensive evaluation of the performance of a fishery.

* A sustainable fishery respects the ecological integrity of the ocean and its resources; is ethical, responsibly governed, economically viable and technologically appropriate; supports communities; draws on local culture, heritage, and diverse knowledge systems; and enhances health, wellbeing and the public good (Project 1.1 Halifax meeting April 2012)

<table>
<thead>
<tr>
<th>Elements of Objectives</th>
<th>Canadian and International Policies: Objectives, Principles and Aims</th>
<th>Potential Performance Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ecological Productivity</strong></td>
<td>Ensure continued health and productivity of Canada’s fisheries and healthy fish stocks ~SFF</td>
<td>• chlorophyll level</td>
</tr>
<tr>
<td>Primary productivity</td>
<td>Long-Term sustainability ~SFF – fish renew; WPS</td>
<td>• biomass(of individual populations, species and trophic levels)</td>
</tr>
<tr>
<td>Secondary productivity</td>
<td>Maintenance of target, bycatch, and ecologically dependent species and their relationships within the bounds of natural fluctuations in abundance ~SFF – new forage</td>
<td>• maximum sustainable yield</td>
</tr>
<tr>
<td>Trophic structure</td>
<td></td>
<td>• abundance of target catch</td>
</tr>
</tbody>
</table>
Minimization of the risk of changes to species’ abundances or relationships which are difficult or impossible to reverse ~SFF – new forage
Conservation of marine resources and habitats ~AFPR; POF; WPS

<table>
<thead>
<tr>
<th>Biodiversity</th>
<th>Protect biodiversity -SFF, MPA</th>
<th>Maintenance of full reproductive potential of the forage species, including genetic diversity and geographic population structure ~SFF – new forage; WPS; Aichi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reduce direct pressures ~Aichi</td>
<td></td>
</tr>
</tbody>
</table>

| Habitat      | Healthy environment -SDS; COS | Protect and conserve fisheries habitat. ~SFF; WPS; AFPR; MPA
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<tr>
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<tbody>
<tr>
<td></td>
<td>Maintain habitat and ecosystem integrity ~WPS</td>
<td>Sustainable use of resources and habitats ~Code</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social and Economic</th>
<th>Sustainable communities</th>
<th>Vibrant society for current and future generations ~SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-reliant fisheries and collaboration will contribute to the well-being of coastal communities ~AFPR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enhance public appreciation of environment, history and culture ~MPA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cater for the well-being of a fishery workforce within a wider community and broader economic context ~FAO Tech8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health and well-being</th>
<th>Ensure safe, healthy, and fair working and living conditions ~FAO Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improve human well-being and equity ~FAO Tech4:2</td>
</tr>
<tr>
<td></td>
<td>Harvesting, handling, processing and distribution should maintain the nutritional value, quality, safety and security of food ~FAO Code</td>
</tr>
<tr>
<td></td>
<td>Consider aquaculture to promote diversification of income and diet ~FAO Code</td>
</tr>
</tbody>
</table>

- abundance of bycatch
- mean trophic level
- change in genetic diversity
- within-species genetic richness
- persistence of population sub-units
- species richness
- species evenness
- community composition
- change in community diversity
- age structure
- change in habitat diversity
- habitat quality and extent
- area impacted by fishery activity
- oxygen and pH levels
- temperature
- nutrient levels
- concentrations of toxics
- population density
- migration rate
- age and gender structure
- persistence of fishing community
- proportion of income and employment derived from fishing sector
- contribution of fishing to services
- amount of poverty and unemployment
- amount of crime and conflict
- access to water and waste services
- types of social networks
- number of recreation opportunities
- level of education
- number of health care facilities
- prevalence of diseases and illnesses
- rates of drug and alcohol use
- rates of abuse
- access to work and recreation
- individual job satisfaction
<table>
<thead>
<tr>
<th>Fisheries</th>
<th>Ethical fisheries</th>
<th>Economic/financial viability</th>
<th>Distribution of access and benefits</th>
<th>Regional economic benefits to community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fisheries</td>
<td>Improve human well-being and equity</td>
<td>Economic prosperity, ~SFF-fish renew; SDS</td>
<td>Provide attractive incomes to industry participants</td>
<td>Provide an economic driver for communities in coastal regions</td>
</tr>
<tr>
<td></td>
<td>~FAO Tech4:2</td>
<td>Fisheries are sustainable and economically viable, contributing to the economic base of coastal communities</td>
<td>~Socio-Eco Frame</td>
<td>~Socio-Eco Frame</td>
</tr>
<tr>
<td></td>
<td>Provide standard of conduct for all persons involved in the fisheries sector</td>
<td>Support sustainable economic opportunities</td>
<td>Attract and retain skilled workers</td>
<td>Ensure that the benefits of fishing licences flow to the fish harvester and the coastal community</td>
</tr>
<tr>
<td></td>
<td>~FAO Code</td>
<td>~COS</td>
<td>~Socio-Eco Frame</td>
<td>~PIIFCAF</td>
</tr>
<tr>
<td></td>
<td>Allocate user rights</td>
<td>Maintain an independent and economically viable inshore fleet</td>
<td>Assist fish harvesters to retain control of their fishing enterprises</td>
<td>Access and allocation of fisheries resources will be more stable and predictable, ~AFPR</td>
</tr>
<tr>
<td></td>
<td>~FAO Tech4:2</td>
<td>~PIIFCAF</td>
<td>~PIIFCAF</td>
<td>~AFPR</td>
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- number of injuries and deaths
- contaminant levels in seafood
- access to food from the sea
- satisfaction with the distribution of benefits (from fishing activities)
- number of youth recruited and retained
- ratio of male to female participation
- percent of population partaking in traditional activities
- first nations participation in fisheries
- use of aboriginal language

- GDP
- economic value of total production
- number of people employed by sector
- debt ratio
- fishing capacity of active vessels
- number of vessels lost
- damage costs
- perception of riskier/safer practices
- number of commercial fishing boats and gear
- distribution landings over time
- unemployment rate
- total annual fisherman days
- changes in crew duties
- new entrant opportunities
- net income per year and vessel
- fleet separation
- intergenerational transfer of access
- industrial concentration
- loss or change in access of sectors
- distribution of goods
- job satisfaction
- number of partnerships
- number of businesses co-existing
- amount of safe infrastructure
- amount of power generated
<table>
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<tr>
<th>Institutional arrangements</th>
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<td>Legislation, policies, plans, programs</td>
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<td>Traditional/Aboriginal governance</td>
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<td>Co-operation</td>
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<td>Co-ordination</td>
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<td>Honour obligations to First Nations and their treaties ~WPS; AFPR</td>
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<td>Work collaboratively within the federal government and among levels of government ~COS</td>
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<td>Share responsibility for achieving common objectives ~COS</td>
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<tr>
<td>Address problems ~Code</td>
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<td>Promoting shared stewardship. ~SFF – fish renew; AFPR</td>
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<td>Self-reliant fisheries and collaboration among all orders of government ~AFPR</td>
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<td>Shared responsibility ~POF; Code</td>
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<td>Conduct in accordance with laws and regulations ~Code</td>
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<td>Maintain and promote public awareness ~Code</td>
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<td>Incorporate biological and socio-economic considerations into harvest decisions. ~ SFF; WPS</td>
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<td>Reflect the best science as well as traditional knowledge ~WPS</td>
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<td>Be based on meaningful public input to ensure they reflect society’s values ~WPS</td>
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<td>Participants will be effectively involved in fisheries management decision-making processes at appropriate levels; they will contribute specialized knowledge and experience, and share in accountability for outcomes ~AFPR; COS; POF; Code, Aichi</td>
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<td>Manage fisheries for sustainable benefits ~WPS</td>
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<td>Effectively involve all interests in appropriate fisheries management processes ~AFPR</td>
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<td>Integrated management ~COS</td>
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<td>Ecosystem-based management ~POF</td>
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</tbody>
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- percent of region with access to utilities
- perception of applicable legislation
- number of NGO/community organizations and institutions
- number of traditional relationships
- number of conflicts over ownership and access rights
- level of participation in leadership
- number of fishers who belong to an organization
- self-governance
- level of attendance at meetings
- perception of conformity of regulation to local values
- perception of effective conflict resolution
- perception of public vs private interests driving decisions
- number of regulatory infractions
- perception of compliance
- number of fishers/public aware of decision outcome
- use of scientific method in problem solving
- Frequency and size of amendments and frameworks
- time for response to environmental changes
- time for delivery of reports
- perception of management complexity
- clarity of principles in management
Flexible (adaptive) management
Precautionary approach ~POF; COS
Flexible management ~POF

- changes in level of conflict
- time and cost for participating in process
- amount of resources allocated for enforcement

* Potential performance indicators were derived from literature and from Project 1.1 group discussions. See the working paper Feb 2013 for more details.

Aichi

AFPR

CLoS

Code

COS

FAO Code

FAO Tech4:2
FAO Tech8
Food and Agriculture Organization of the United Nations. 1999. FAO Technical Guidelines for Responsible Fisheries 8: Indicators for sustainable development of marine capture fisheries

MPA

PIIFCA

POF

SDS

SFF

Socio-Eco Frame

WPS
Fisheries and Oceans Canada. 2005. Canada’s Policy for Conservation of Wild Pacific Salmon. Her Majesty the Queen in Right of Canada, Vancouver, BC.
This framework was developed by discussions among the members of Project 1.1 including a small task group consisting of Rob Stephenson, Tony Charles, Dan Lane, Paul Foley and Lindsay Jennings, with input from Marc Clemens and Melanie Wiber.

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