

Cumulative Effects of Marine Shipping

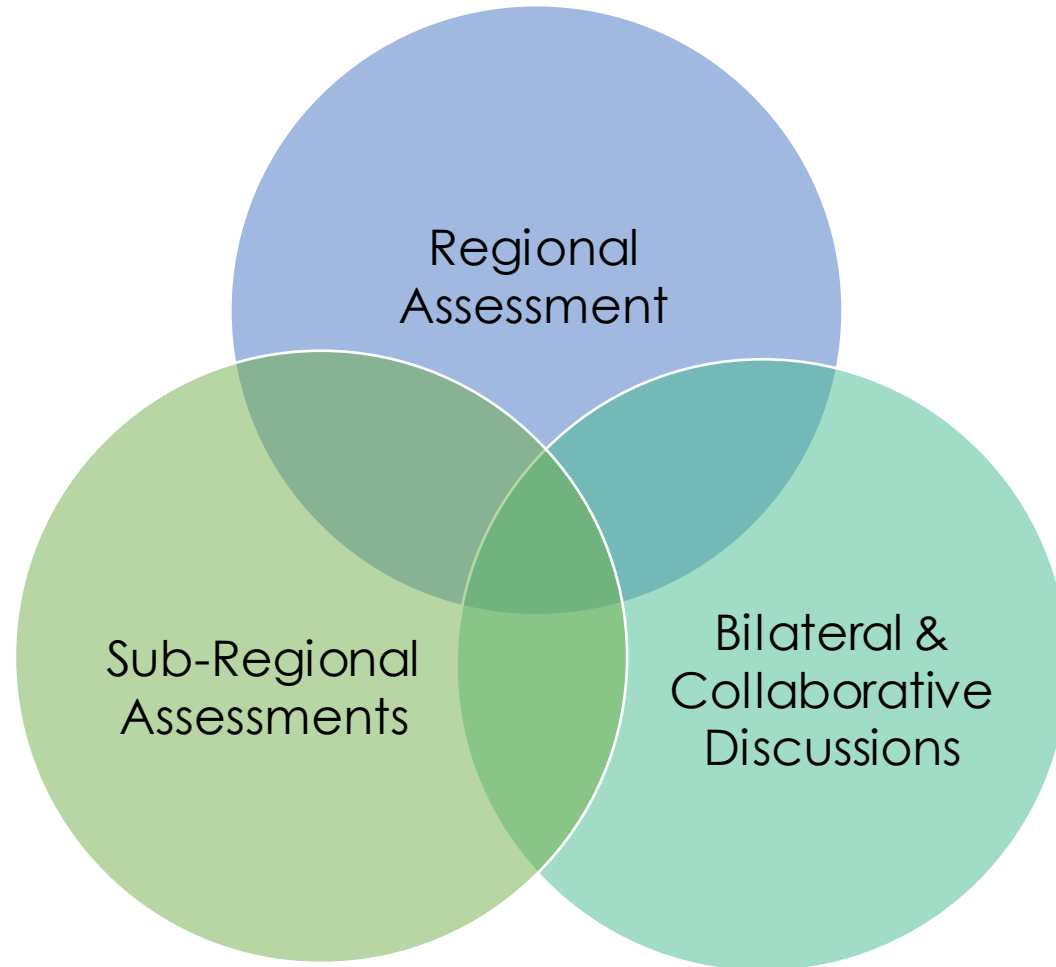
Overview of South Coast Regional Scoping Phase

April 2022



CEMS South Coast Implementation: Multi-layered Assessment Approach

Indigenous CE Frameworks and Management systems will inform and drive all layers of assessment



Implemented through the **Ship Movement and Vessel Management Coordinating Committee (VMCC)**

Implemented within **Subregions** of South Coast BC; help to inform the Regional Assessment and vice versa.

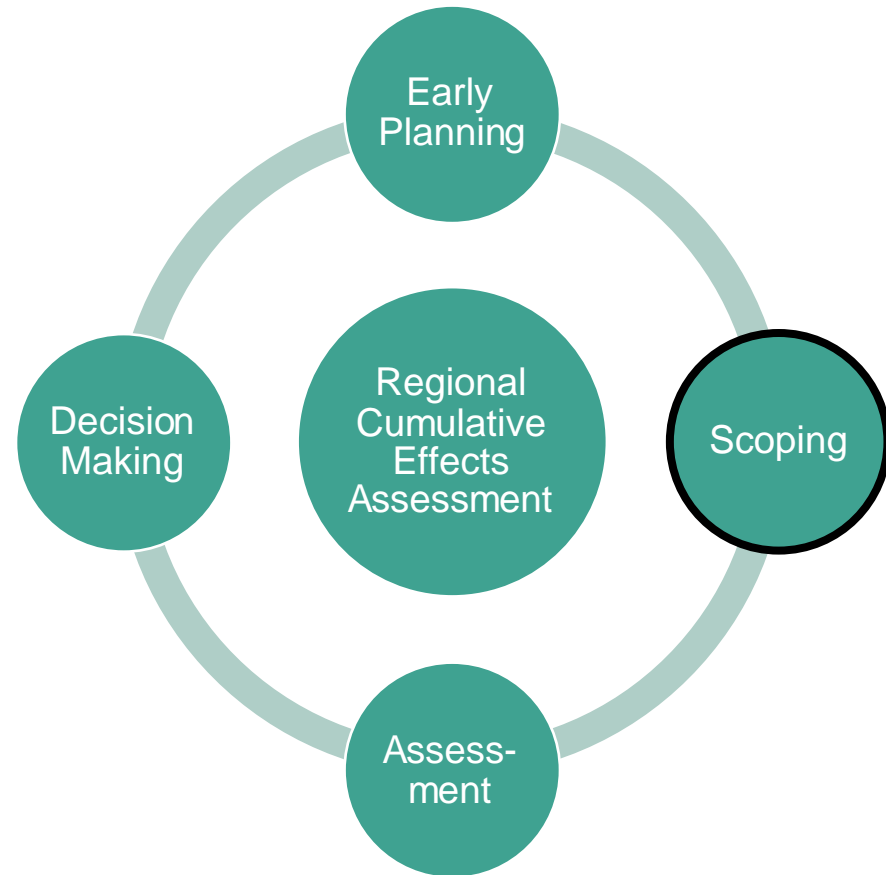
Bilateral and Collaborative discussions will inform the other layers of Assessment.

South Coast VMCC-CEMS

Early Planning Phase



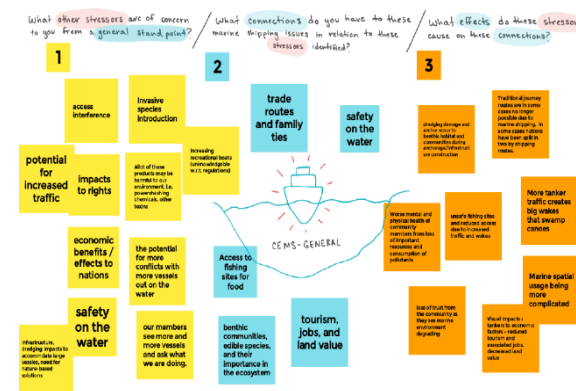
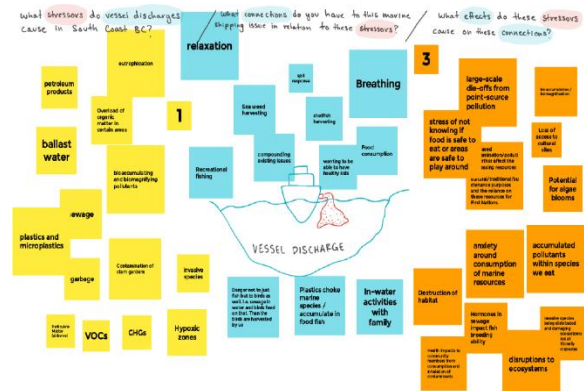
VMCC work done to date in our **Scoping Phase**



	Date	Event	Objectives	Outcomes
1	March 2021	Virtual workshop	Draw connections between indigenous values and marine shipping	Discussed weaving multiple knowledge systems; initiated brainstorming on issues
2	March 2021	Virtual workshop	Finding linkages between shipping effects and indigenous values	Continued brainstorming on issues and linkages
3	April 2021	Virtual workshop	Review marine shipping connection wheels; introduce scoping criteria	Developed Marine shipping Connection wheels
	May 2021	Virtual Knowledge Sharing Forum	Bring together indigenous perspectives on Cumulative Effects	Shared knowledge and ideas on how to collaboratively advance CEMS work
4a	June 2021	Virtual workshop	Brainstorm VMCC scoping criteria	Developed VMCC Scoping Criteria
4b	Summer 2021	Summer survey	Affirm condensed list of scoping criteria and apply to connection wheel	Survey results analyzed on prioritized connections
5	Nov 2021	Virtual workshop	Further refine the set of connections to determine Final Scope of Assessment	Confirm preferred option for refining the Scope of Assessment
6	Dec 2021	Virtual workshop	Presentation of and Discussion about Preferred Approach	Confirm Scope of Assessment

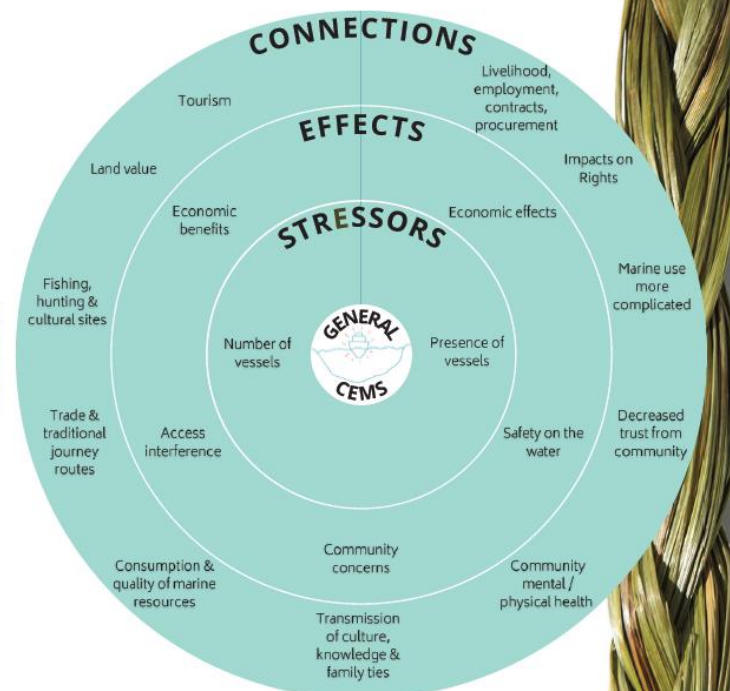
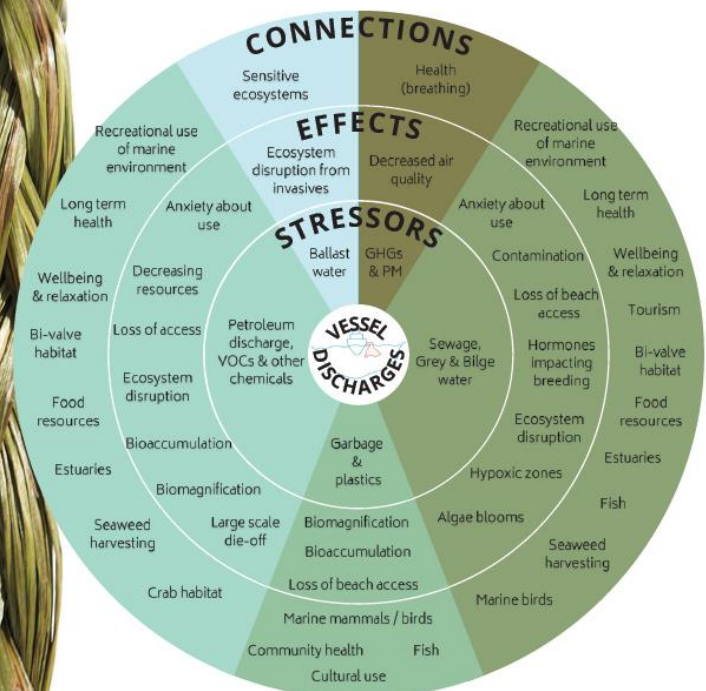
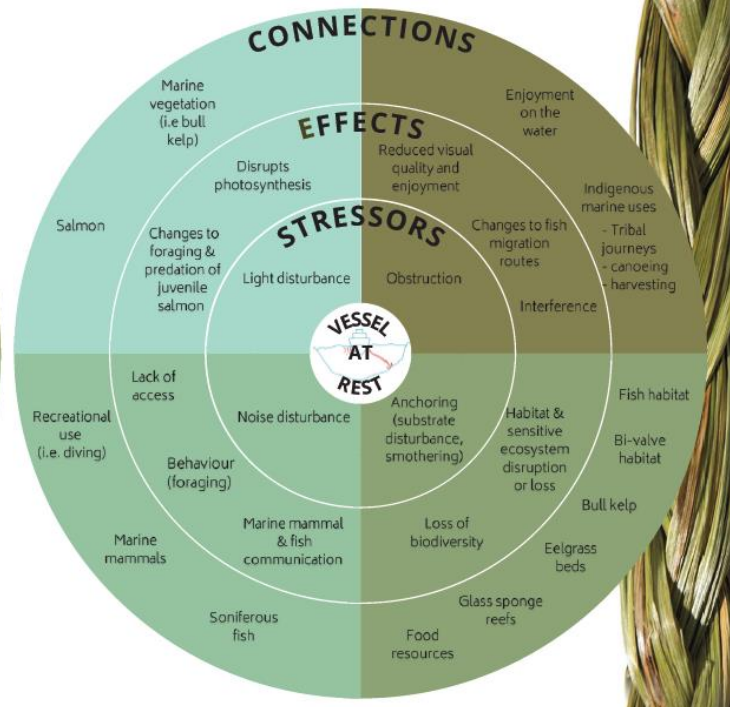
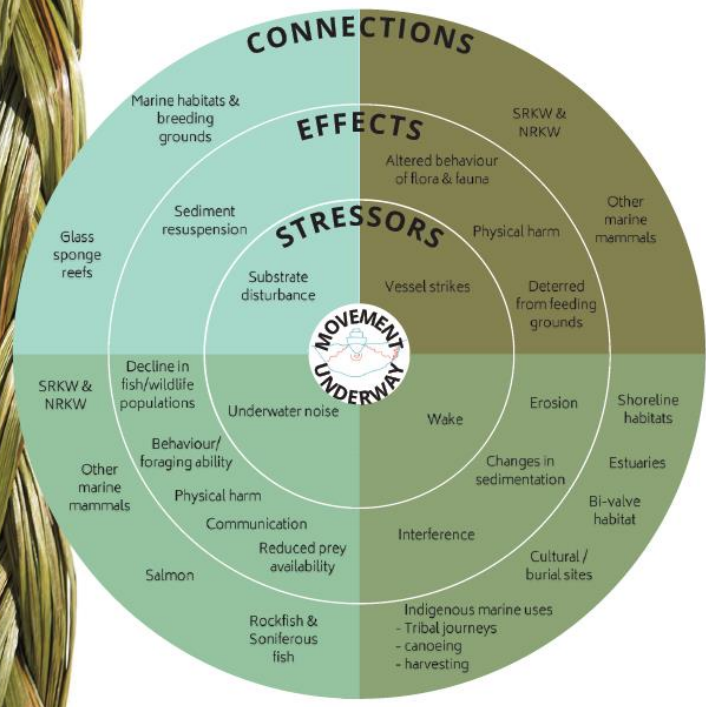
Scoping Workshop 2: Building a comprehensive inventory of marine shipping issues and assessment priorities

1. What other stressors are of concern to you from a general standpoint
2. What connections do you have to these marine shipping issues in relation to these stressors?
3. What effects do these stressors cause on these connections?



Scoping Workshop 3:

Review marine shipping connection wheels; introduce scoping criteria



CE Knowledge Sharing Forum:

Scoping examples provided from other CE projects

CEMS:
Arctic Pilot

CEMS: St.
Lawrence,
QC Pilot

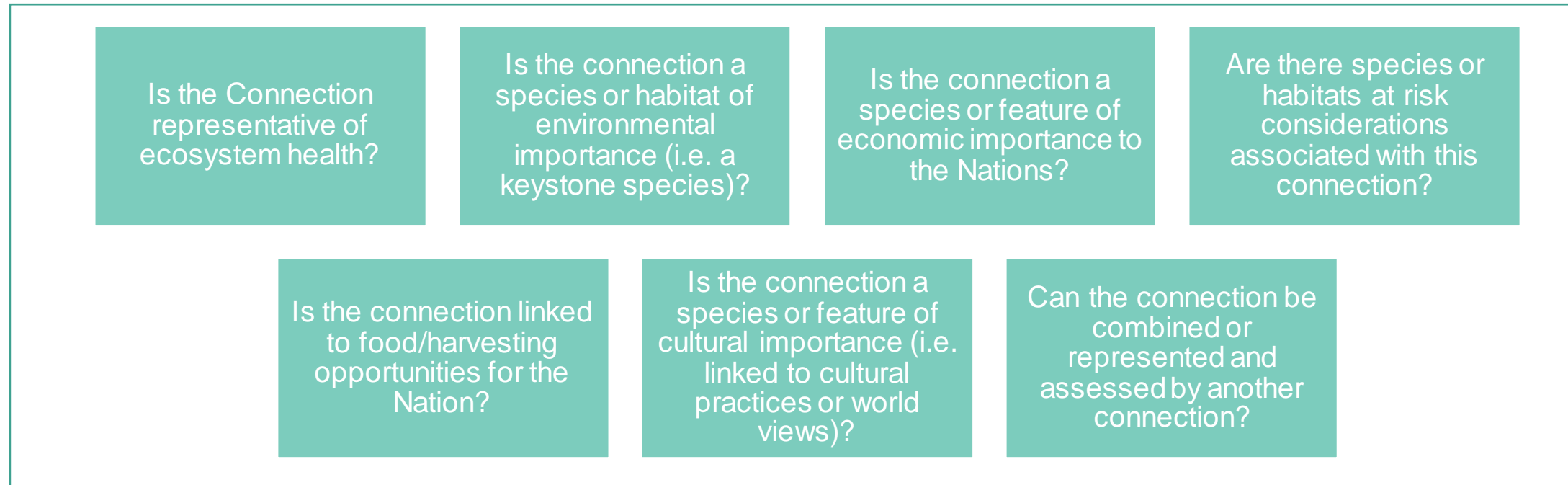
CEMS:
North Coast
BC pilot

Metlakatla
CEM
Framework

Gitxaala
CEM
Framework

Examples of Scoping Criteria	TC Criteria	CEMS North Coast, BC	CEMS St Lawrence, QC	CEMS Arctic	Metlakatla CEM Framework	Gitxaala Framework
Regionally Relevant	√	√	√	√		
Ability to influence management (pull management lever)	√	√		√	√	
Feature Susceptible to change / Vulnerable / Responsive / is the value sensitive to current/future development	√	√	√	√	√	
Data available to support its assessment	√	√		√		√
Comprehensive / Concise / Easy to understand / Good “pilot” exercise	√		√			
Representative	√		√		√	√
Does the value hold traditional importance		√			√	√
Does the value hold an important role in the ecosystem					√	
Are there species, habitats, communities at risk considerations associated with this value					√	
Is it covered under another initiative	√					√
Does the Nation have an existing mandate to manage and effect change for the value					√	
Does the Nation have the capacity to implement a monitoring program for the value should impacts be found					√	
Scoping Criteria – Prioritized results		Underwater Noise, Vessel Strikes, Indigenous Marine Uses	Wildlife, plants, sites of interest, hunting / fishing sites, marine mammals, ship wake, sociocultural components	Underwater Noise, Discharges-oil spills, Ship wake, Ice breaking	Environment: Butter Clams Cultural Identify: Food, Social, Ceremonial Activity Social/Health: Housing	Salmon, Access to resources, Eelgrass (One bite at a time..)

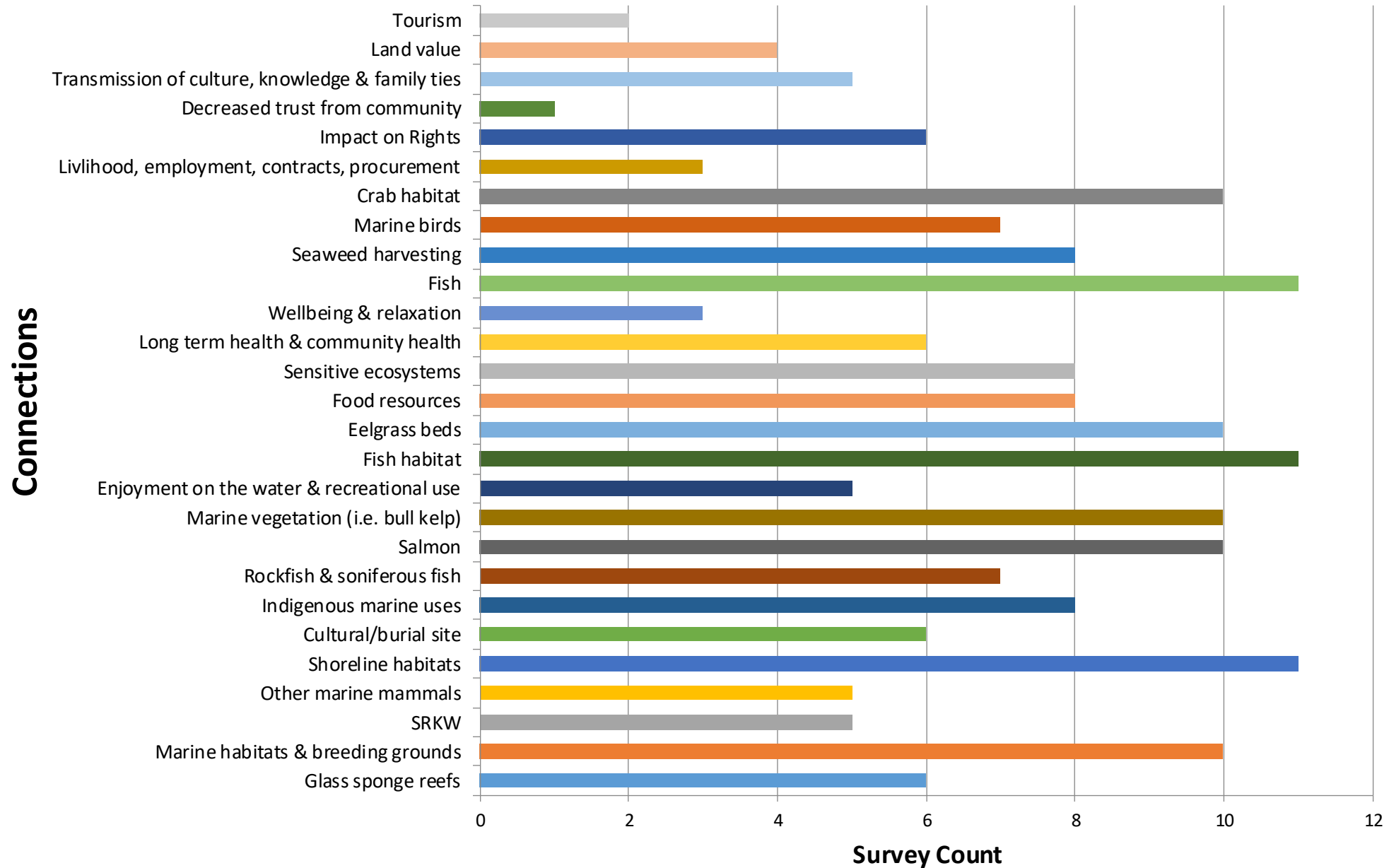
Scoping Workshop 4a: Brainstorming Scoping Criteria



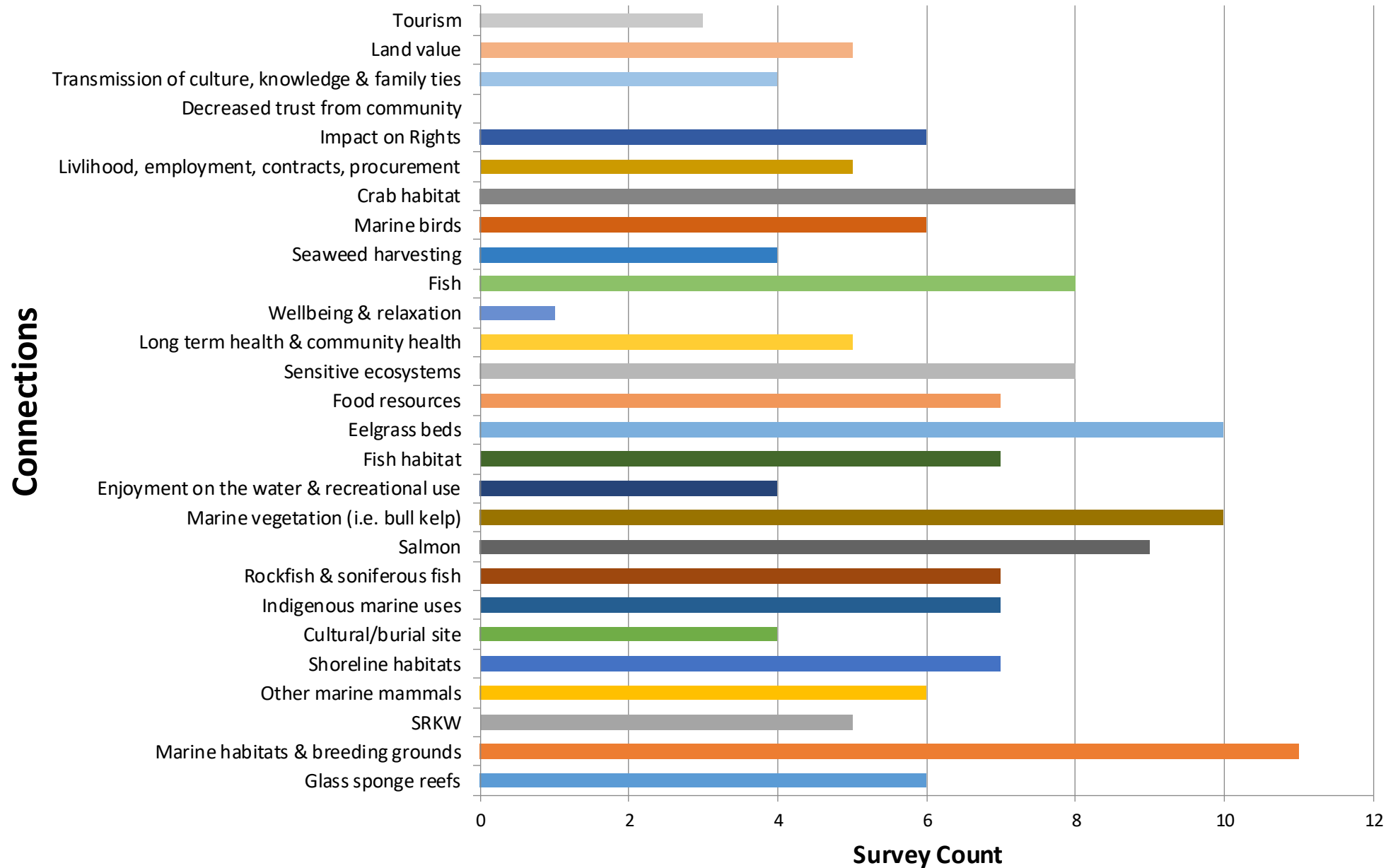
Scoping Criteria Exercise:
Summer Survey

4b. Summer 2021 Work – Online Survey results

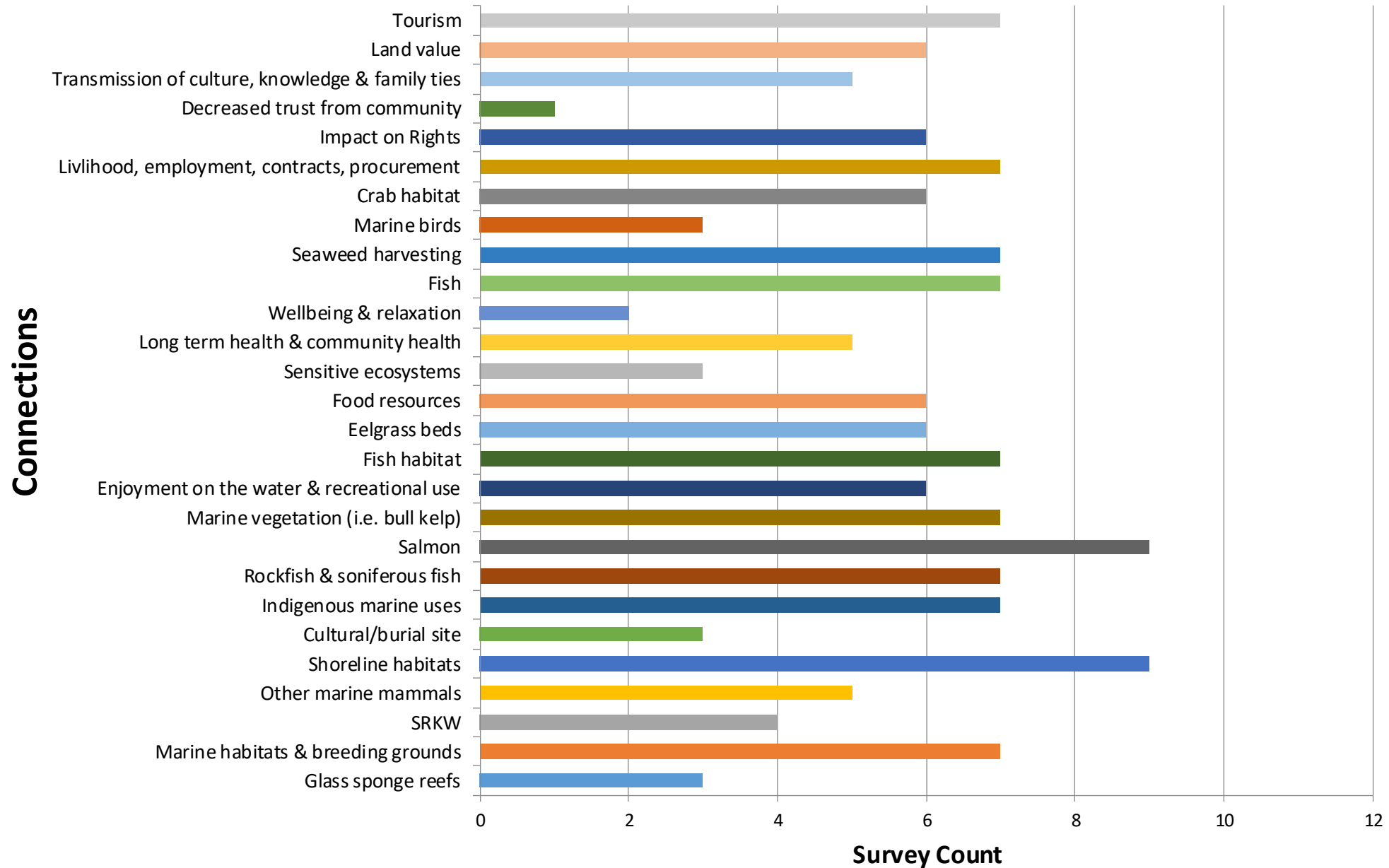
Scoping Criteria: Is the connection representative of ecosystem health?



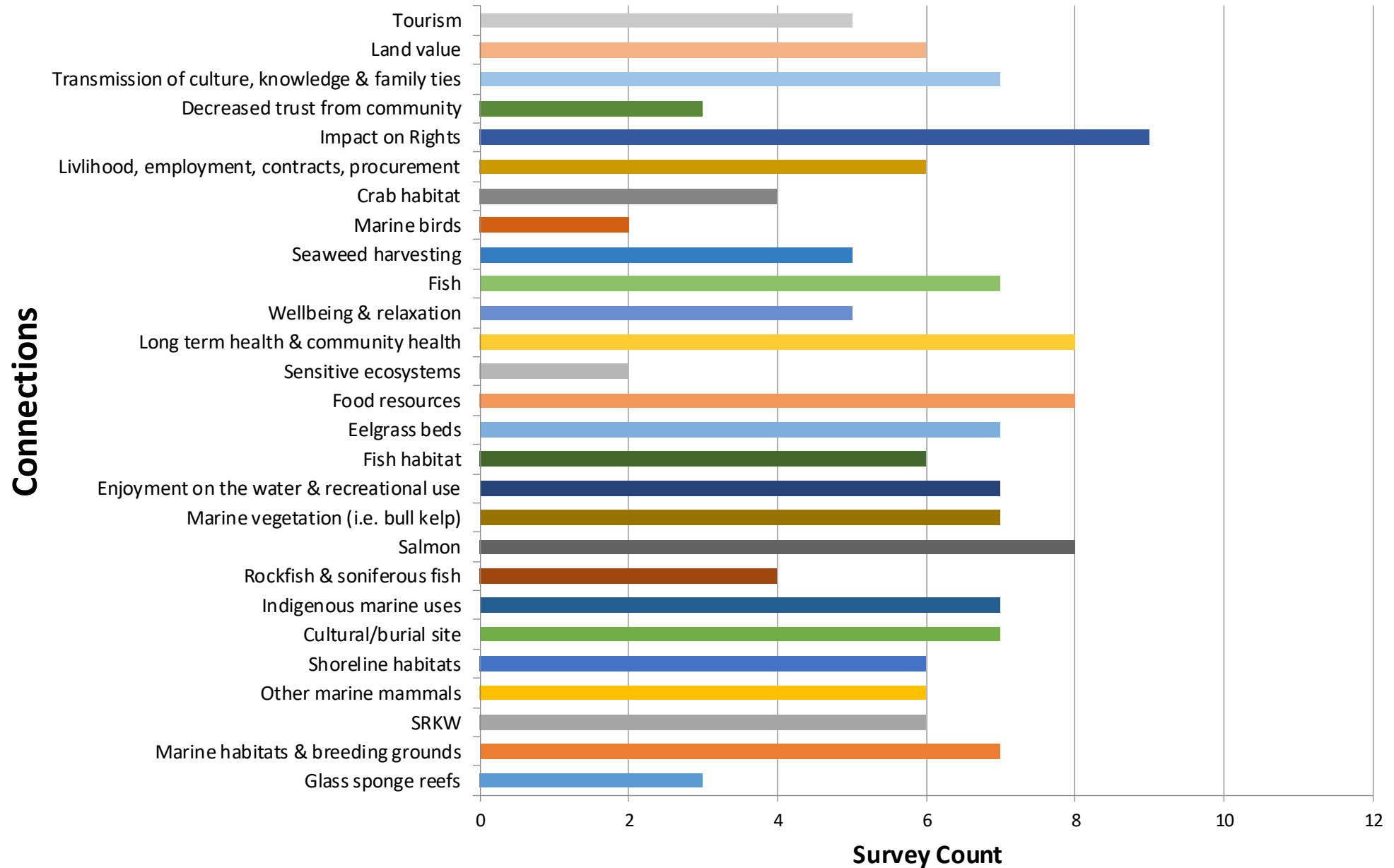
Scoping Criteria: Is the connection a species or habitat of environmental importance (i.e. a keystone species)?



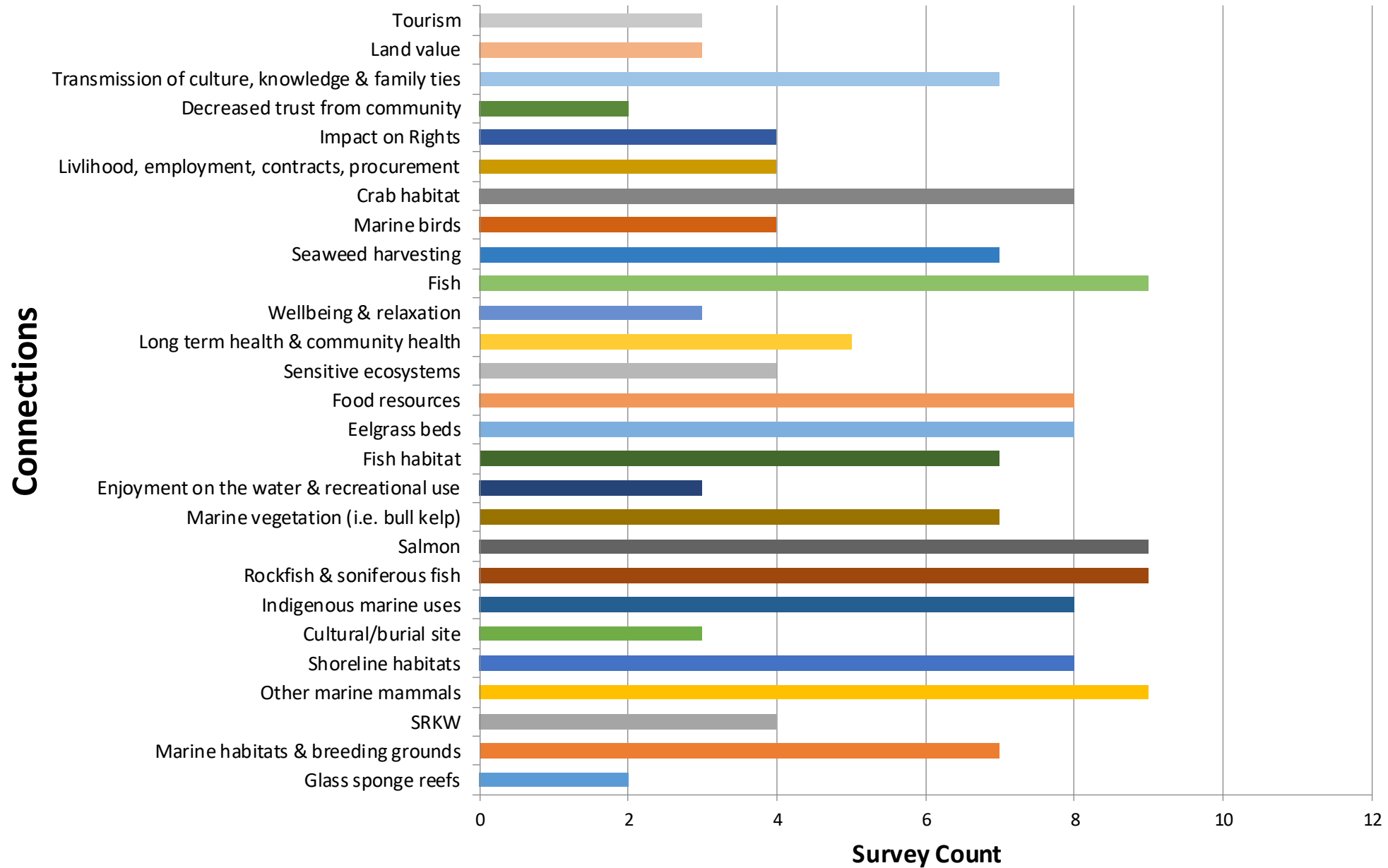
Scoping Criteria: Is the connection a species or feature of economic importance to the Nations?



Scoping Criteria: Is the connection a species or feature of cultural importance (i.e. linked to cultural practices or world views)?



Scoping Criteria: Is the connection linked to food/harvesting opportunities for the Nation?



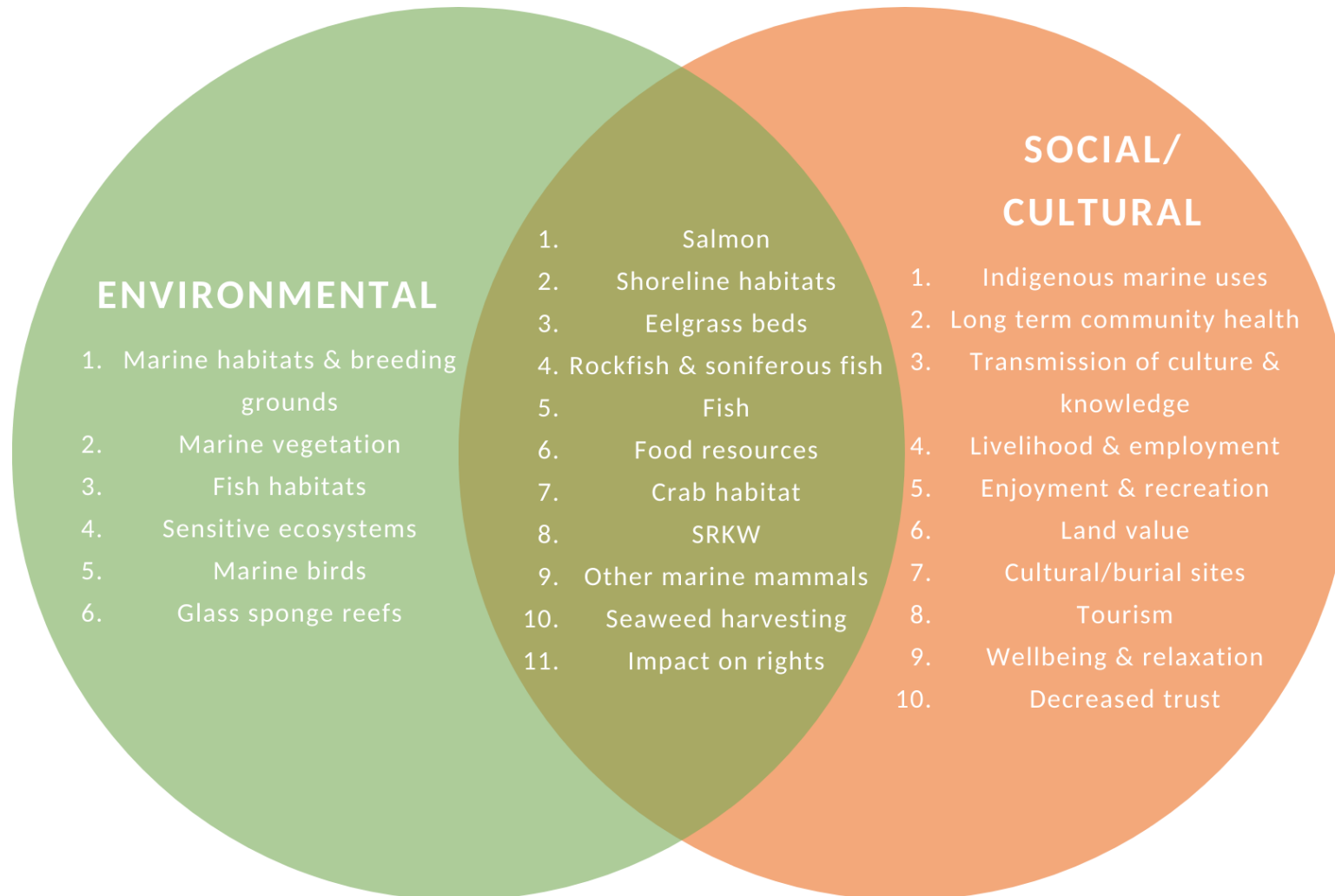
Scoping Criteria Matrix Results (larger table available)

		VMCC Connections														
		Glass sponge reefs	Marine habitats & breeding grounds	SRKW	Other marine mammals	Shoreline habitats	Cultural/burial site	Indigenous marine uses	Rockfish & soniferous fish	Salmon	Marine vegetation (i.e. bull kelp)	Enjoyment on the water & recreational use	Fish habitat	Eelgrass beds	Food resources	Sensitive ecosystems
VMCC Criteria	Is the connection representative of ecosystem health?	0.55	0.91	0.45	0.45	1.00	0.55	0.73	0.64	0.91	0.91	0.45	1.00	0.91	0.73	0.73
	Is the connection a species or habitat of environmental importance (i.e. a keystone species)?	0.55	1.00	0.45	0.55	0.64	0.36	0.64	0.64	0.82	0.91	0.36	0.64	0.91	0.64	0.73
	Is the connection a species or feature of economic importance to the Nations?	0.27	0.64	0.36	0.45	0.82	0.27	0.64	0.64	0.82	0.64	0.55	0.64	0.55	0.55	0.27
	Is the connection a species or feature of cultural importance (i.e. linked to cultural practices or world views)?	0.27	0.64	0.55	0.55	0.55	0.64	0.64	0.36	0.73	0.64	0.64	0.55	0.64	0.73	0.18
	Is the connection linked to food/harvesting opportunities for the Nation?	0.18	0.64	0.36	0.82	0.73	0.27	0.73	0.82	0.82	0.64	0.27	0.64	0.73	0.73	0.36
	Are there species or habitats at risk considerations associated with this connection?	1	1	1		1			1	1				1		1
TC Criteria	Is it regionally relevant and representative?		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Is there some ability to influence management? (i.e. regulatory, legislative, policy, programs)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Are the features susceptible to change from vessel impacts?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Does it provide a good opportunity for analysis and a good 'pilot' exercise?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOTAL # of Criteria met		5.82	8.82	7.18	6.82	8.73	6.09	7.36	8.09	9.09	7.73	6.27	7.45	8.73	7.36	7.27

Ordered List of Connections

1. Salmon
2. Marine habitats & breeding ground
3. Shoreline habitats
4. Eelgrass beds
5. Rockfish & soniferous fish
6. Fish
7. Marine vegetation (i.e. bull kelp)
8. Fish habitat
9. Food resources
10. Indigenous marine uses
11. Sensitive ecosystems
12. Crab habitat
13. SRKW
14. Marine birds
15. Other marine mammals
16. Seaweed harvesting
17. Impact on Rights
18. Long term health & community health
19. Transmission of culture, knowledge & family ties
20. Livelihood, employment, contracts, procurement
21. Enjoyment on the water & recreational use
22. Land value
23. Cultural/burial site
24. Glass sponge reefs
25. Tourism
26. Wellbeing & relaxation
27. Decreased trust from community

Ordered List of Connections categorized by **Environmental**, **Social/Cultural** and both themes



DISCUSSION:

What parameters do we want to use for selecting the top Connections?

Option 1:

- Top 10 Connections from the overall prioritized list

Option 2:

- Top 3-5 from each section of the Environmental & Social/Cultural Venn Diagram

Option 3:

- All of the combined Connections that overlap Environmental and Social/Cultural in the middle of the Venn Diagram

Option 4:

- Group into larger categories with combined sub-indicators

Option 5

- Refine by stressor (look at one piece of the pie)

- Which options do you like and why?
- Which options don't you like and why?
- Any other options we should consider? Preference?

Further refining our Assessment:

What thresholds or parameters do we want to use for selecting the top Connections?

Option 1:

- Top 10 Connections from the overall prioritized list

Option 2:

- Top 3-4 from each section of the Environmental & Social/Cultural Venn Diagram

Option 3:

- All of the combined Connections that overlap Environmental and Social/Cultural in the middle of the Venn Diagram

Option 4:

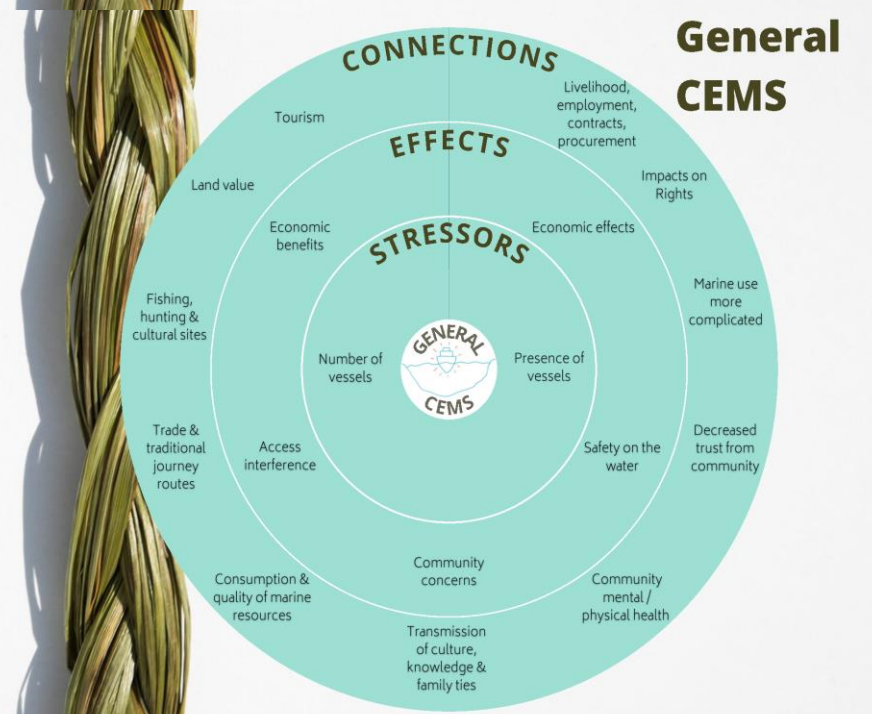
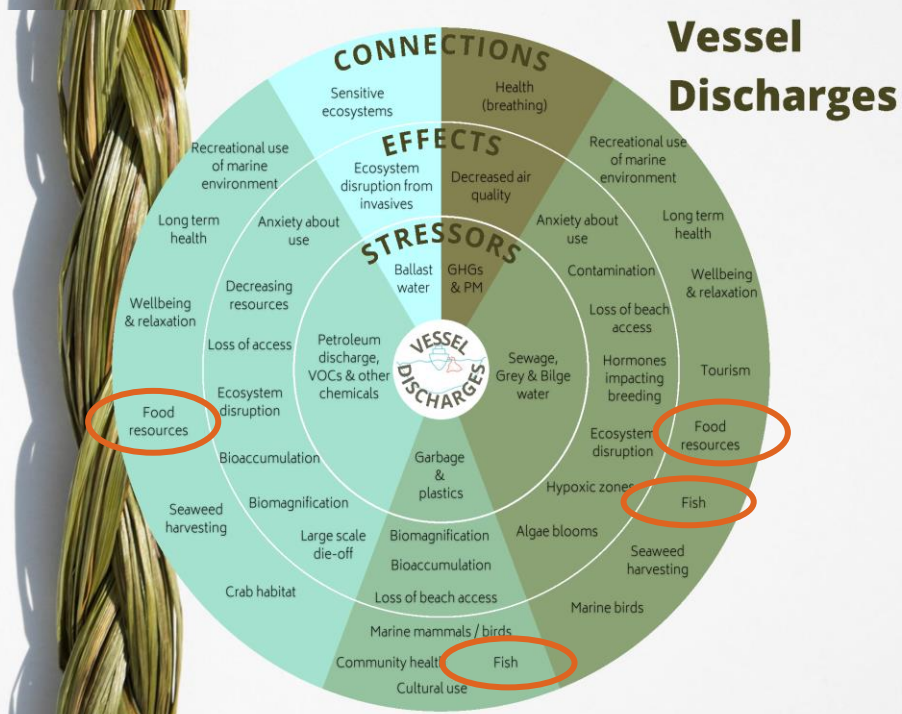
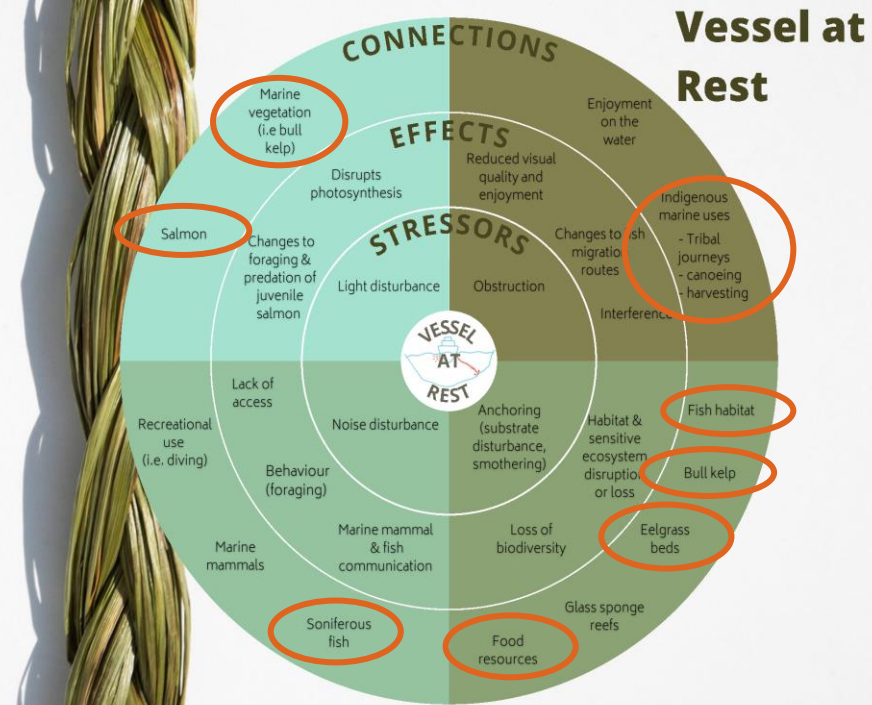
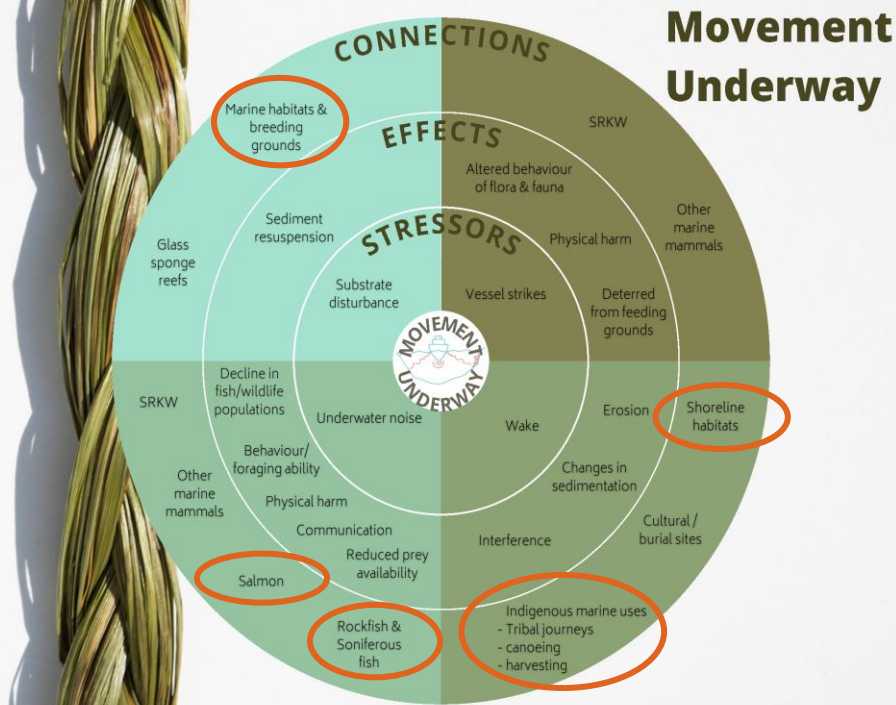
- Group into larger categories with combined sub-indicators

Option 5

- Refine by stressor (look at one piece of the pie)

1. **Salmon**
2. **Marine habitats & breeding grounds**
3. **Shoreline habitats**
4. **Eelgrass beds**
5. **Rockfish & soniferous fish**
6. **Fish**
7. **Marine vegetation (i.e. bull kelp)**
8. **Fish habitat**
9. **Food resources**
10. **Indigenous marine uses**
11. Sensitive ecosystems
12. Crab habitat
13. SRKW
14. Marine birds
15. Other marine mammals
16. Seaweed harvesting
17. Impact on Rights
18. Long term health & community health
19. Transmission of culture, knowledge & family ties
20. Livelihood, employment, contracts, procurement
21. Enjoyment on the water & recreational use
22. Land value
23. Cultural/burial site
24. Glass sponge reefs
25. Tourism
26. Wellbeing & relaxation
27. Decreased trust from community

Option 1



Further refining our Assessment:

What parameters do we want to use for selecting the top Connections?

Option 1:

- Top 10 Connections from the overall prioritized list

Option 2:

- **Top 3-4 from each section of the Environmental & Social/Cultural Venn Diagram**

Option 3:

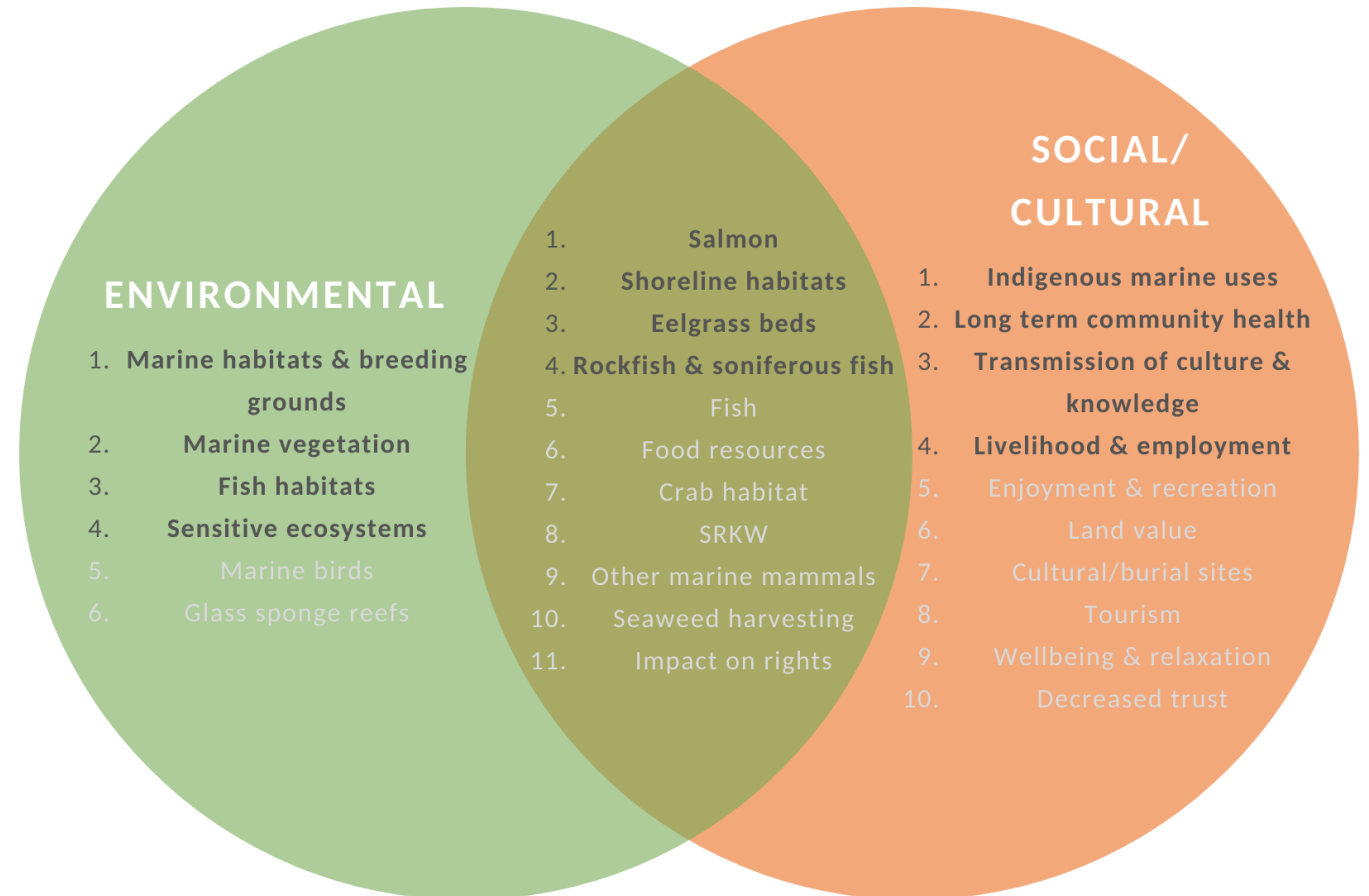
- All of the combined Connections that overlap Environmental and Social/Cultural in the middle of the Venn Diagram

Option 4:

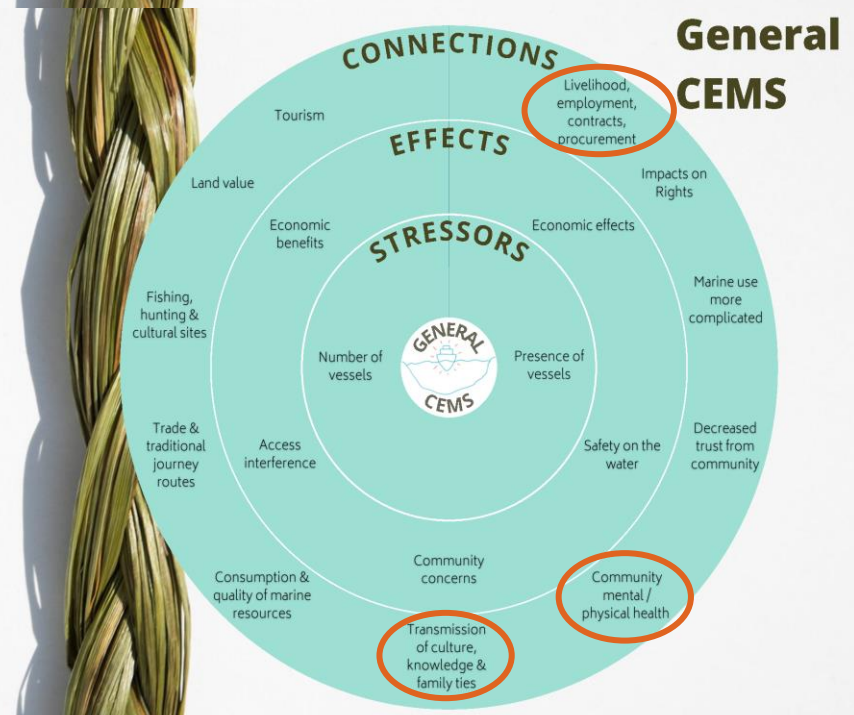
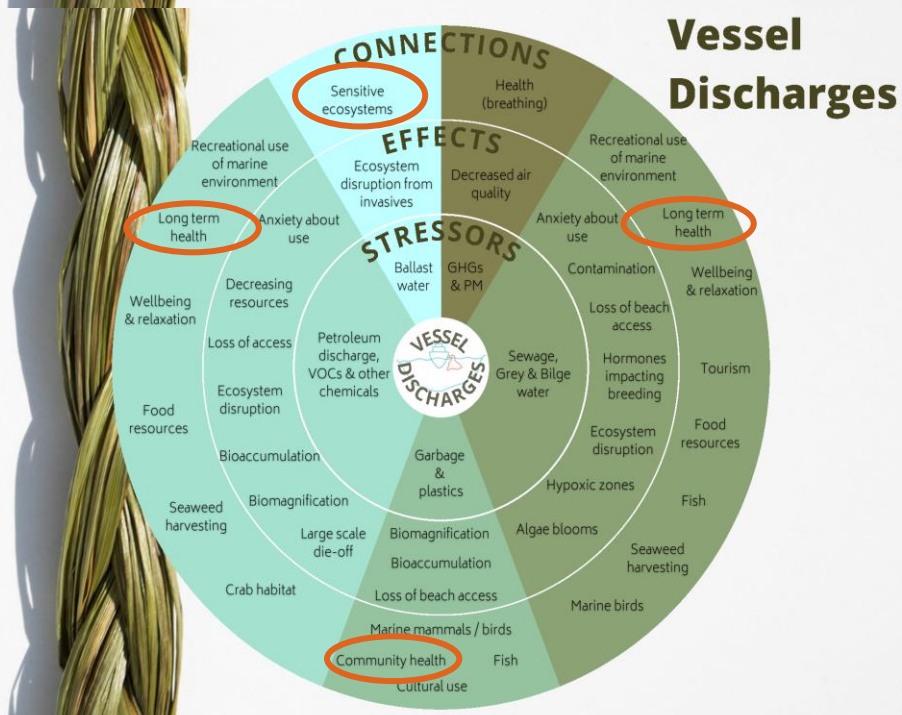
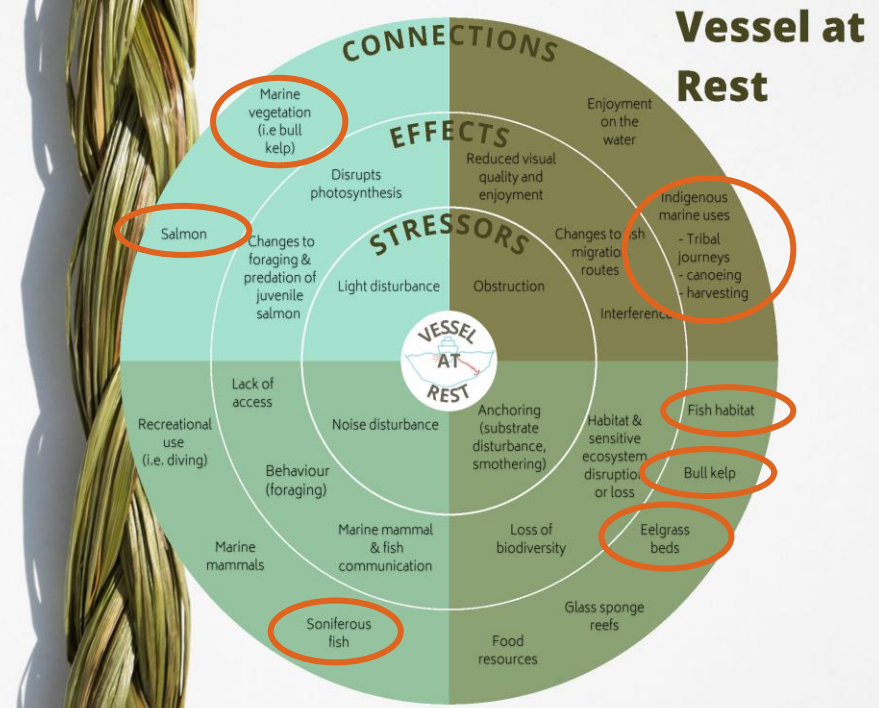
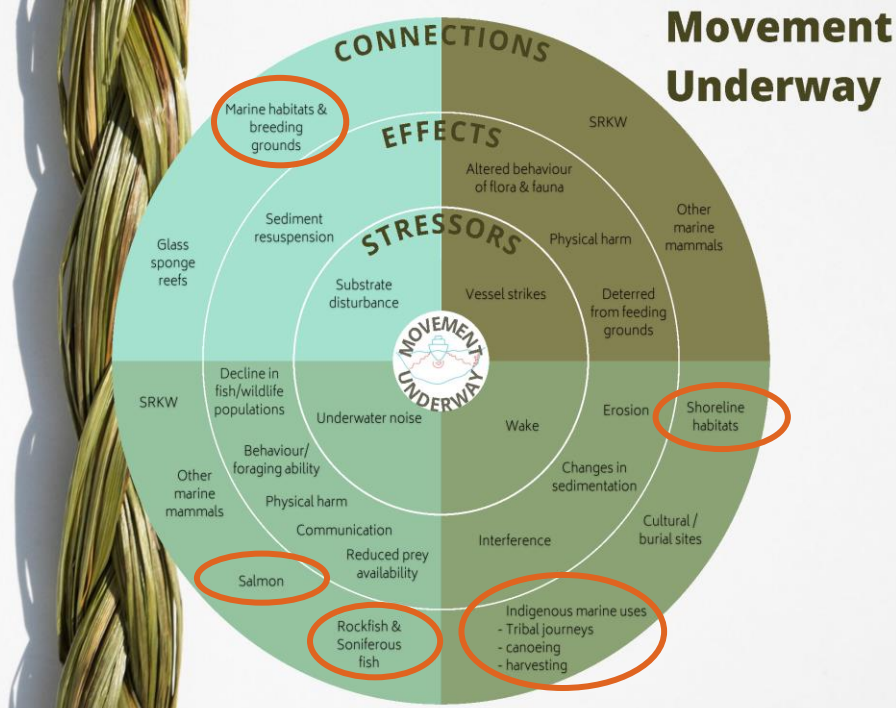
- Group into larger categories with combined sub-indicators

Option 5

- Refine by stressor (look at one piece of the pie)



Option 2



Further refining our Assessment:

What parameters do we want to use for selecting the top Connections?

Option 1:

- Top 10 Connections from the overall prioritized list

Option 2:

- Top 3-4 from each section of the Environmental & Social/Cultural Venn Diagram

Option 3:

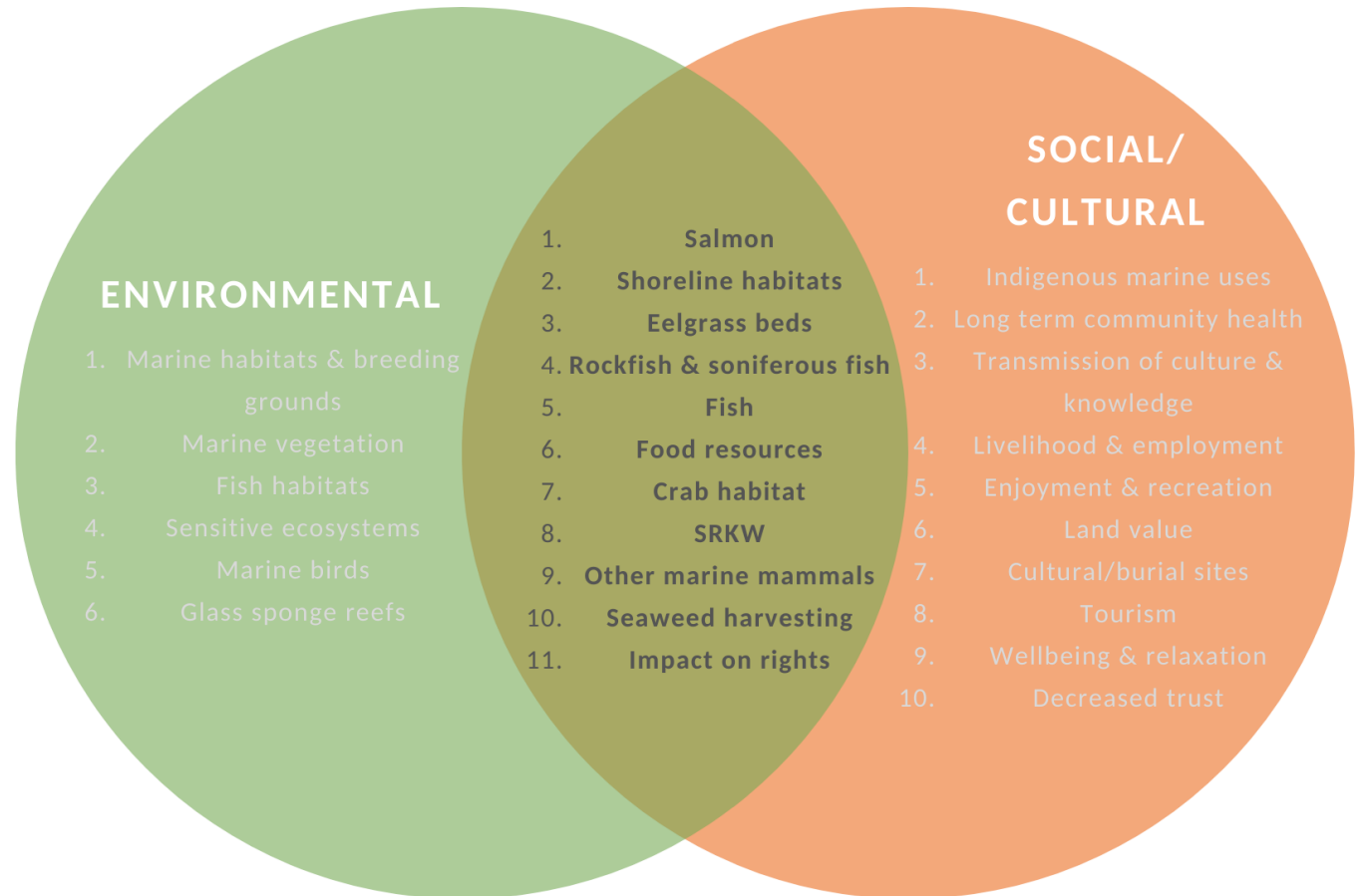
- **All of the combined Connections that overlap Environmental and Social/Cultural in the middle of the Venn Diagram**

Option 4:

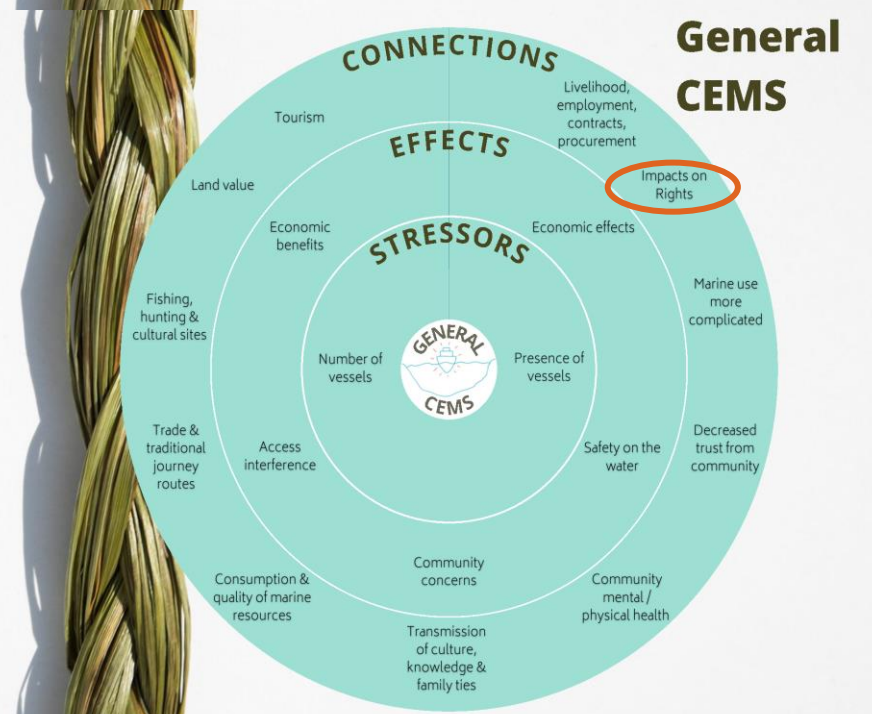
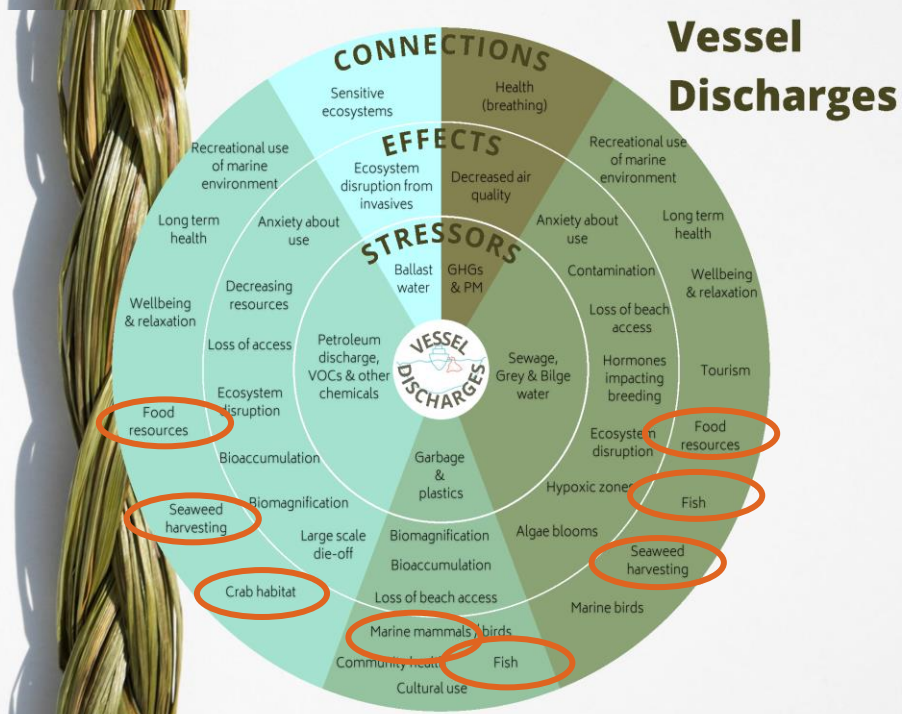
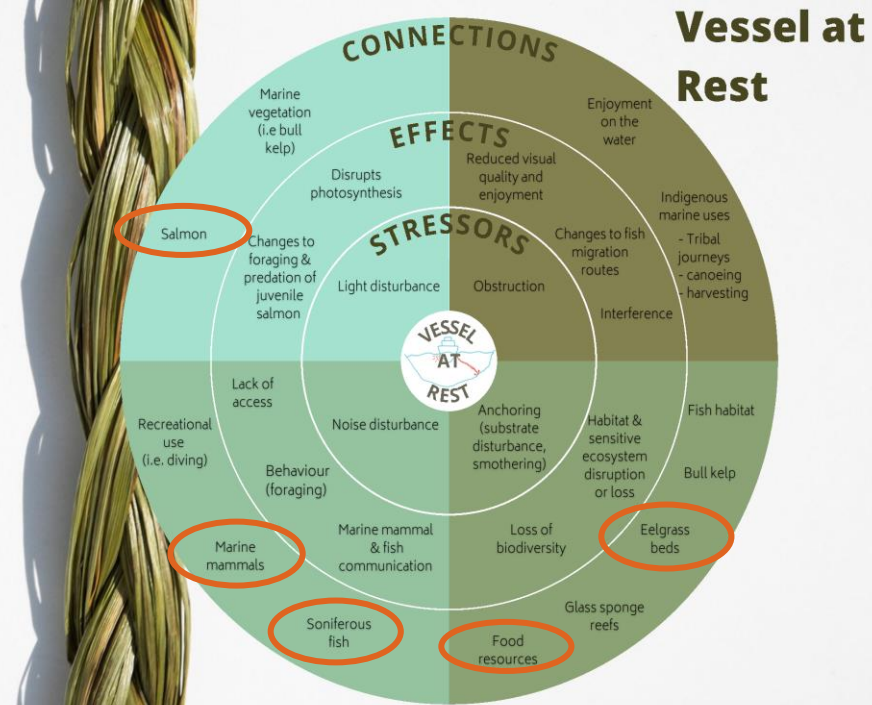
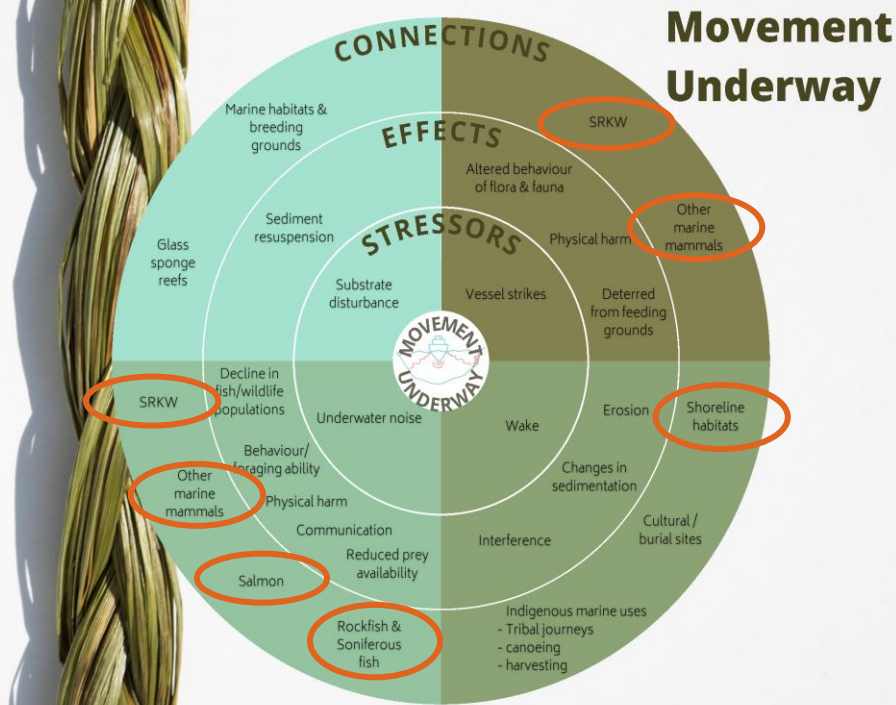
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Option 5

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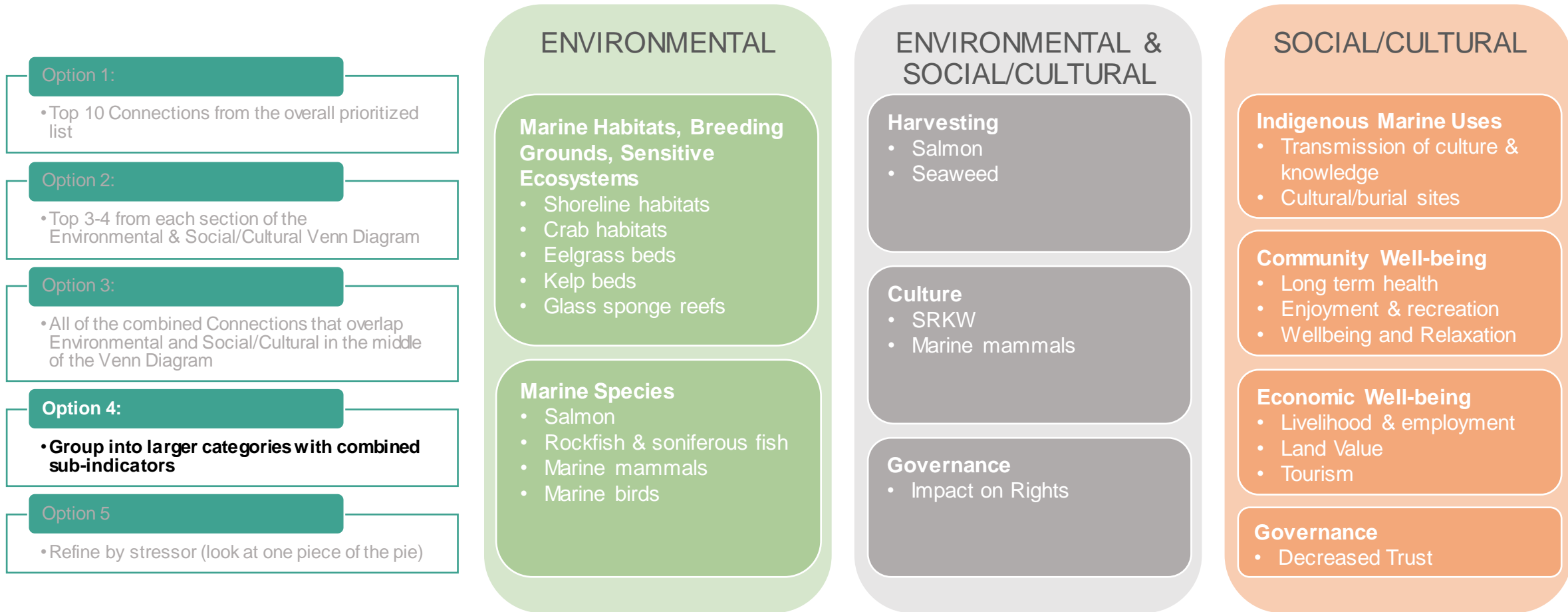


Option 3



Further refining our Assessment:

What parameters do we want to use for selecting the top Connections?



Further refining our Assessment: What parameters do we want to use for selecting the top Connections?

Option 1:

- Top 10 Connections from the overall prioritized list

Option 2:

- Top 3-4 from each section of the Environmental & Social/Cultural Venn Diagram

Option 3:

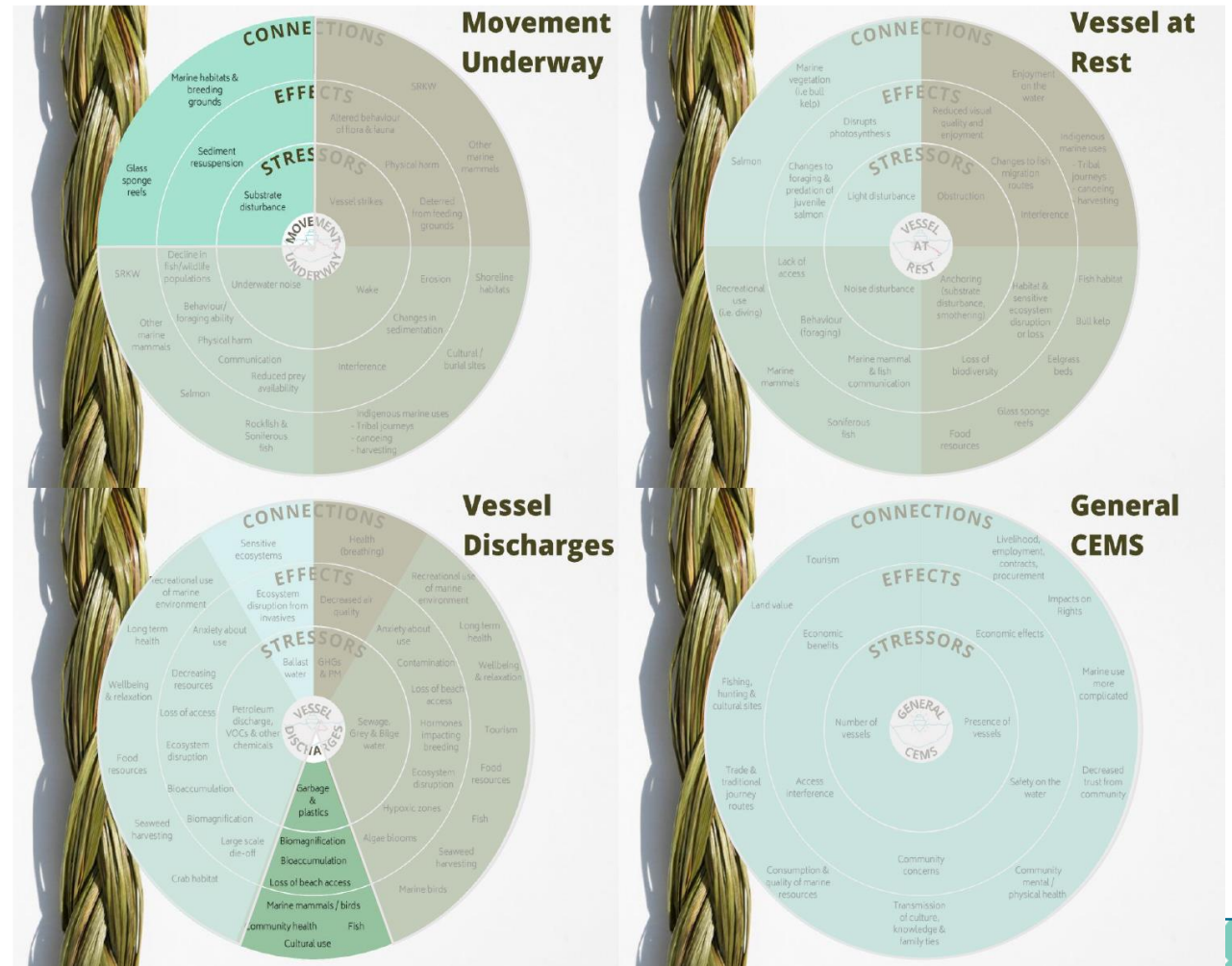
- All of the combined Connections that overlap Environmental and Social/Cultural in the middle of the Venn Diagram

Option 4:

- Group into larger categories with combined sub-indicators

Option 5

- Refine by stressor (look at one piece of the pie)



Scoping Workshop 5: Considerations for refining the Scope of our Assessment

Consideration of VMCC-CEMS Objectives in Living Workplan

- Management levers

Linkages to other tables / initiatives

- Do not want to duplicate efforts
- Be aware of available data sets
- Knowledge sharing across common areas of interest

Capacity and feasibility

- Aligning with realistic expectations – not spreading ourselves too thin
- Level of community involvement

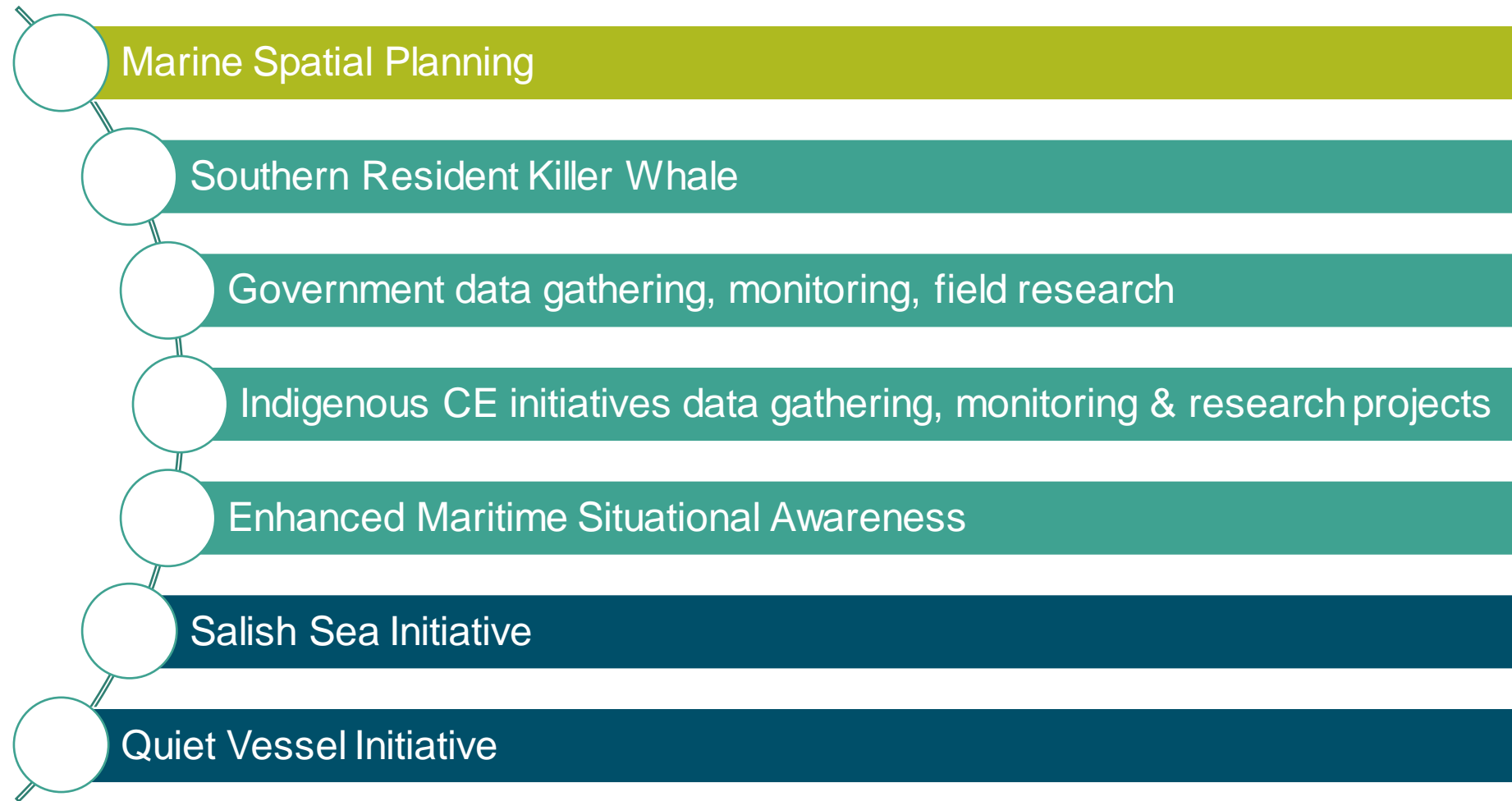
Ability to reuse CE methodologies once understood

- Can be applied to other VC's in our inventory

The General CEMS wheel (number and presence of vessels) are captured in the other 3 wheels

Whatever option we pick is the right way, we should just get started

Closer linkages to CEMS and complementary work



Preferred approach through consensus/discussion: Combination of options 1 and 4

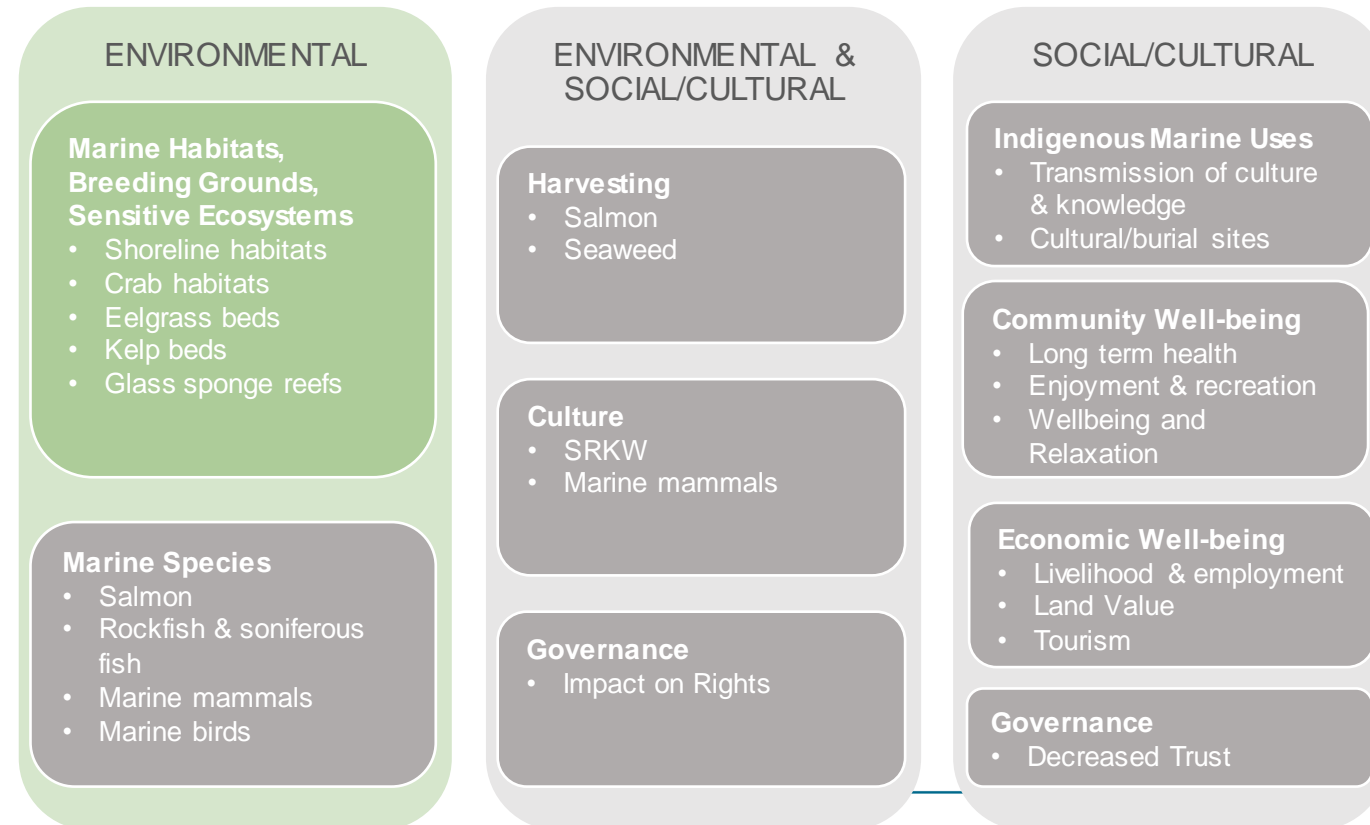
Option 1:

- Top 10 Connections from the overall prioritized list

- | | |
|-------------------------------------------------|------------------------------------------------------|
| 1. Salmon | 16. Seaweed harvesting |
| 2. Marine habitats & breeding ground | 17. Impact on Rights |
| 3. Shoreline habitats | 18. Long term health & community health |
| 4. Eelgrass beds | 19. Transmission of culture, knowledge & family ties |
| 5. Rockfish & soniferous fish | 20. Livelihood, employment, contracts, procurement |
| 6. Fish | 21. Enjoyment on the water & recreational use |
| 7. Marine vegetation (i.e. bull kelp) | 22. Land value |
| 8. Fish habitat | 23. Cultural/burial site |
| 9. Food resources | 24. Glass sponge reefs |
| 10. Indigenous marine uses | 25. Tourism |
| 11. Sensitive ecosystems | 26. Wellbeing & relaxation |
| 12. Crab habitat | 27. Decreased trust from community |
| 13. SRKW | |
| 14. Marine birds | |
| 15. Other marine mammals | |

Option 4:

- Group into larger categories with combined sub-indicators



Scoping Workshop 6: Confirm focus of Regional Scope of Assessment

Marine Shipping Activities,
Stressors & Effects



Marine Habitats, Breeding Grounds, Sensitive Ecosystems

Fish Habitat

Shoreline habitats

Crab habitats

Eelgrass beds

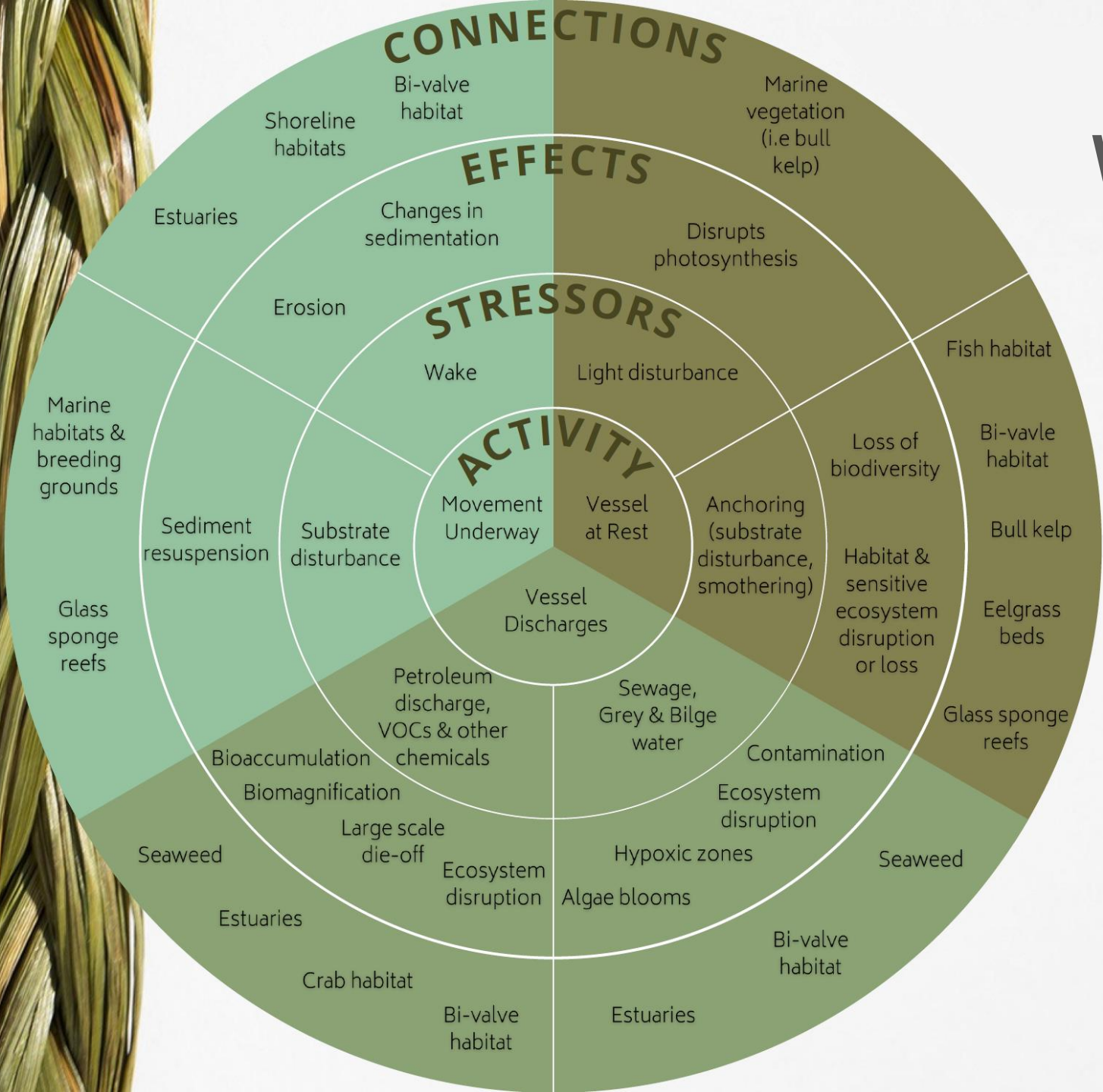
Kelp beds

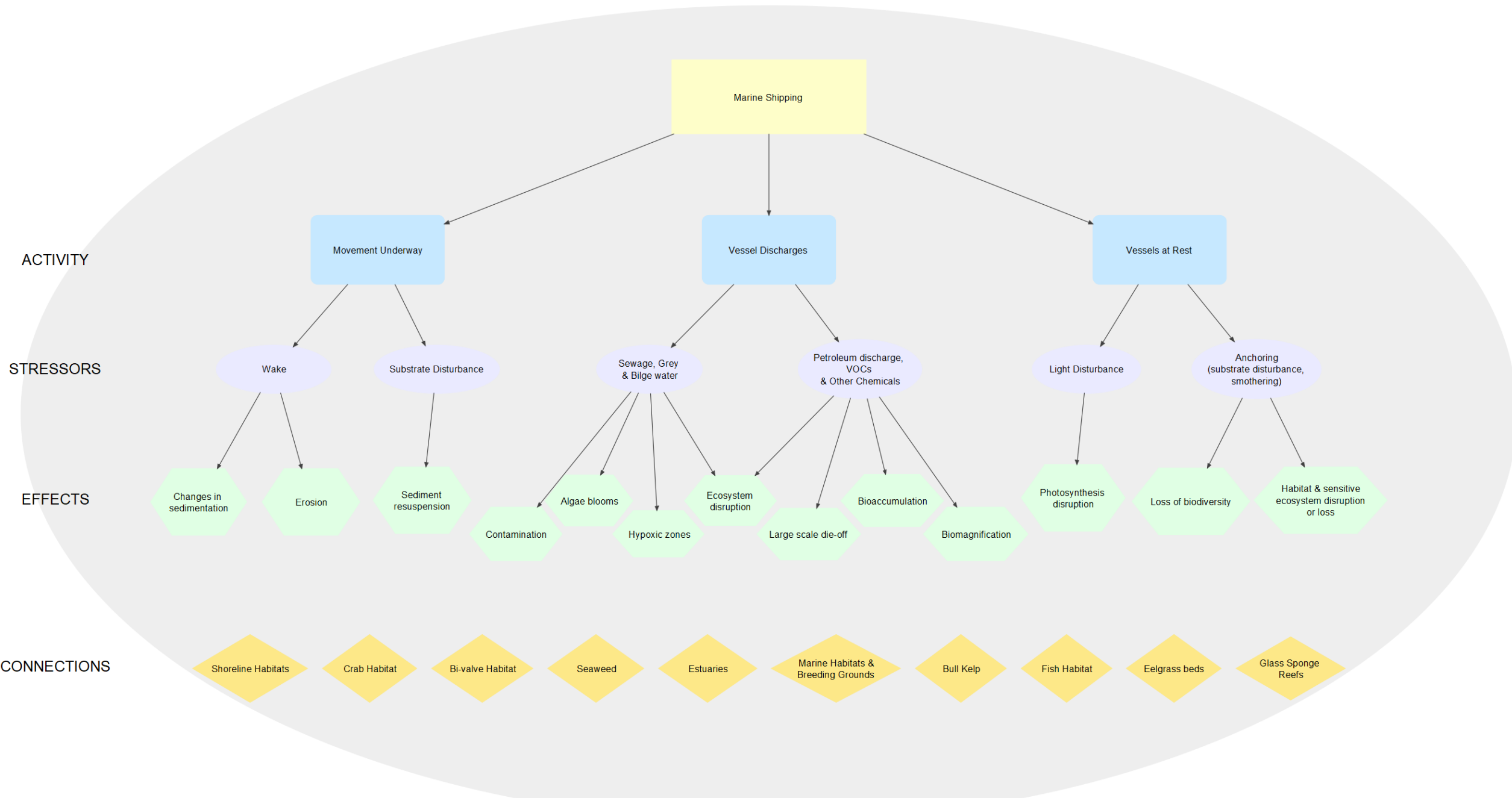
Glass sponge reefs

Estuaries

Bi-valve Habitat

CEMS Connection Wheel with focus of Regional Assessment





Marine Shipping

Movement Underway

Vessel Discharges

Vessels at Rest

Wake

Substrate Disturbance

Sewage, Grey & Bilge water

Petroleum discharge, VOCs & Other Chemicals

Light Disturbance

Anchoring (substrate disturbance, smothering)

Changes in sedimentation

Erosion

Sediment resuspension

Contamination

Algae blooms

Hypoxic zones

Ecosystem disruption

Large scale die-off

Bioaccumulation

Biomagnification

Photosynthesis disruption

Loss of biodiversity

Habitat & sensitive ecosystem disruption or loss

Shoreline Habitats

Crab Habitat

Bi-valve Habitat

Seaweed

Estuaries

Marine Habitats & Breeding Grounds

Bull Kelp

Fish Habitat

Eelgrass beds

Glass Sponge Reefs

ACTIVITY

STRESSORS

EFFECTS

CONNECTIONS

Possible TC management levers for the Preferred approach

Marine Shipping Activity	Marine Shipping Stressor	Effect	Possible Management Lever
Movement underway	Substrate disturbance	Sediment resuspension	Vessel speeds, vessel slow-downs, Interim orders or Notice to Mariners under the CSA, changes in timing of traffic
	Wake	Erosion	Vessel speeds, vessel slowdowns, Collision regs under the CSA, Communication protocols
		Changes in sedimentation	Vessel speeds, vessel slowdowns, Collision regs under the CSA, Communication protocols
Vessel at rest	Light disturbance	Disrupts photosynthesis	Interim order under the CSA, Port procedures under the Canada Marine Act
	Anchoring	Habitat and sensitive ecosystem disruption or loss	
		Loss of biodiversity	
Vessel discharges	Ballast water	Ecosystem disruption from invasives	*Ballast Water Control and Management Regulations
	Sewage, Grey water & Bilge water	Contamination	Amendments to the Vessel Pollution and Dangerous Chemicals Regulations
		Ecosystem disruption	
		Hypoxic zones	
		Algae blooms	
	Petroleum discharge, VOCs & other	Decreasing resources	Amendments to the Vessel Pollution and Dangerous Chemicals Regulations
		Ecosystem disruption	
Large scale die-off			

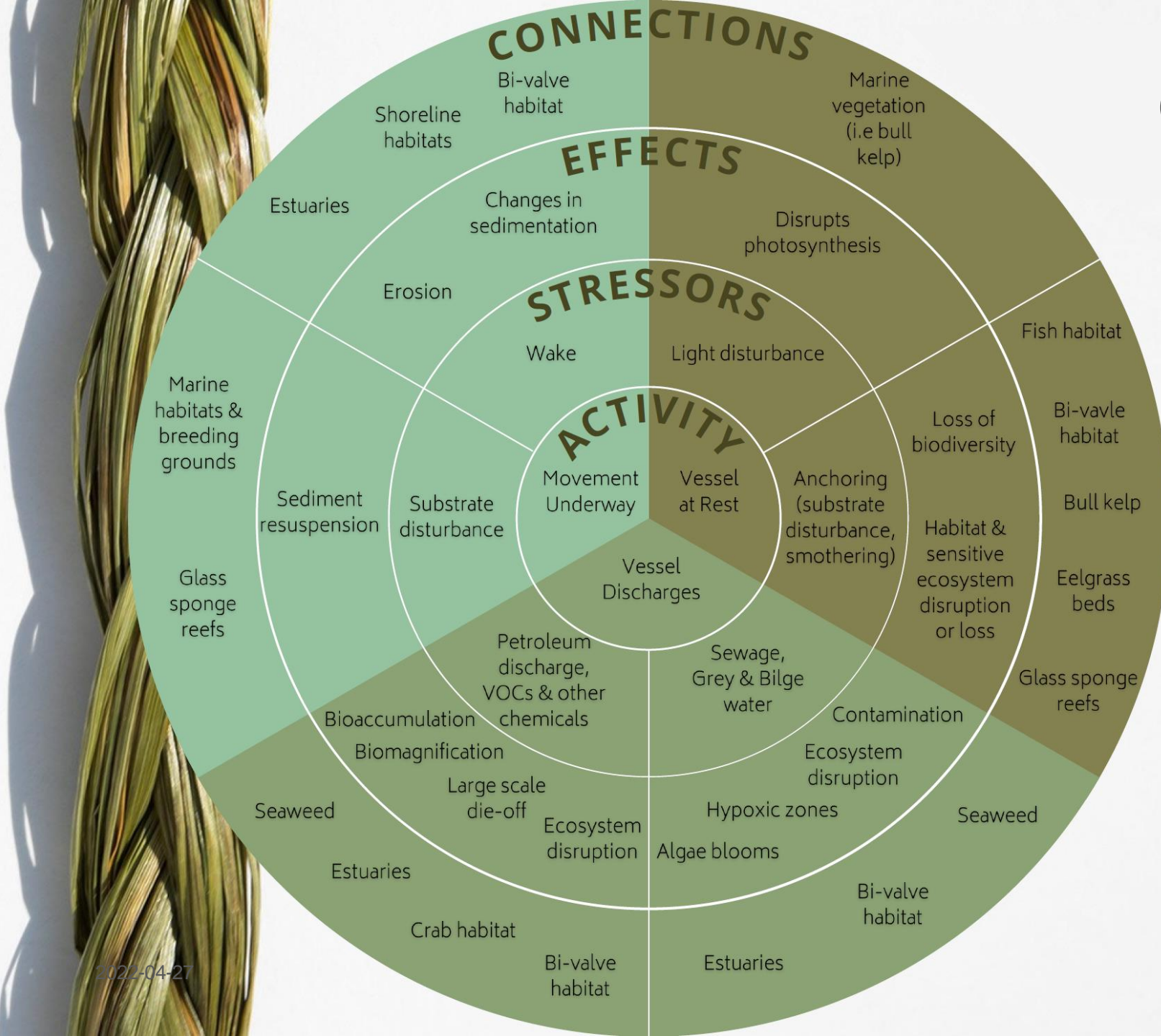
Pre-Assessment: Considerations moving into the Assessment Phase

Do we want to learn from others conducting CEMS pilot project Assessments?

Should we pull together a summary of Assessment methods being used under CEMS?

Is the Committee open to using agreed-to 3rd party contractors for support?

Do we want to form smaller working groups to tackle different connections?



Pre-Assessment: Considerations moving into the Assessment Phase

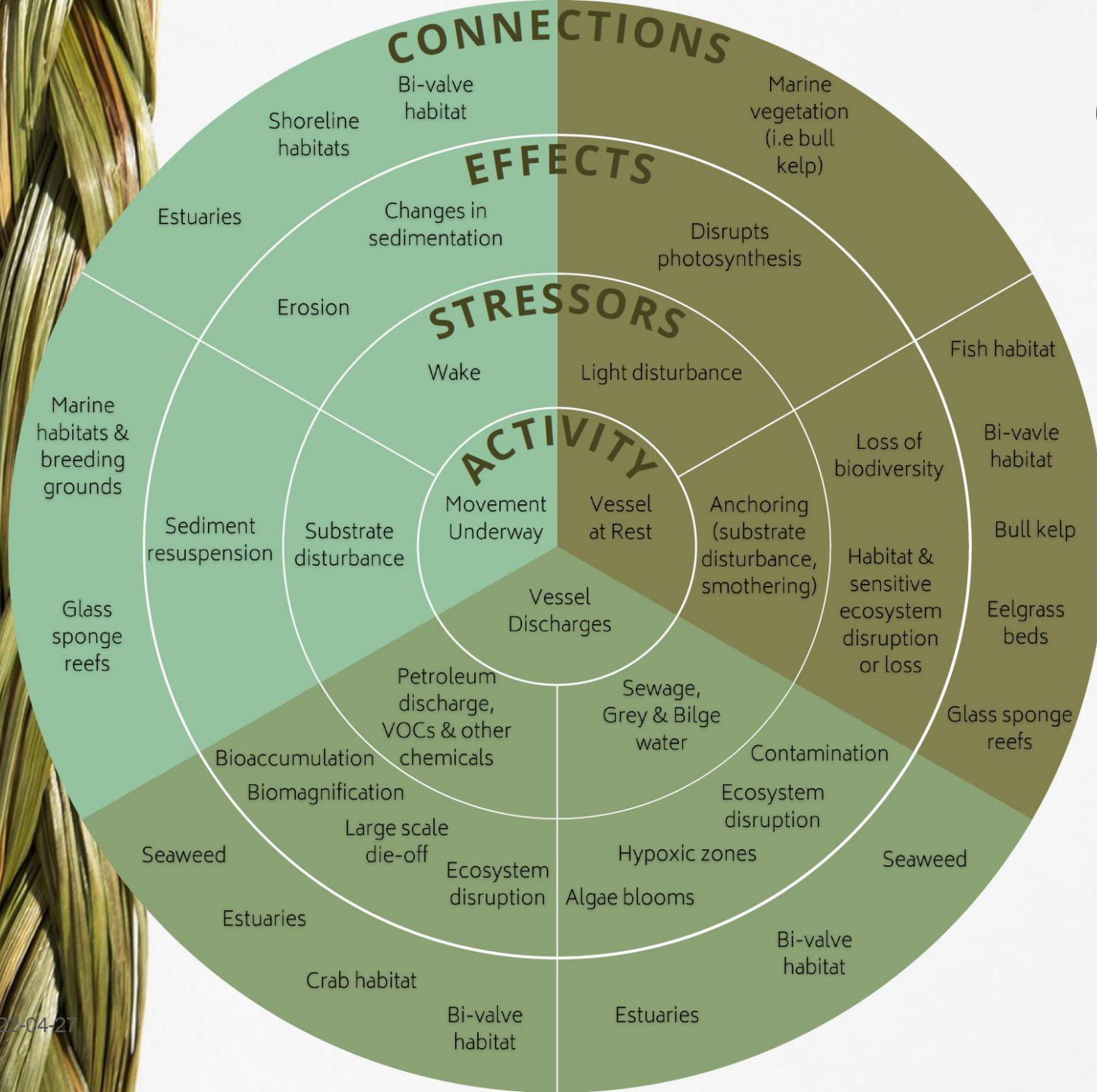
What are our data and knowledge needs? How and where should we look for data & knowledge?

Do we want to start identifying and engaging groups with respect to data?

How should we embrace a multiple ways of knowing approach?

Wrt vessel data – CEMS egis portal is available

Others?



Graphic recordings of Scoping Phase

CUMULATIVE EFFECTS OF MARINE SHIPPING (CEMS) Scoping Workshops

THIS IS THE RICE-OFF OF THE SCOPING PHASE OF THE CEMS SOUTH COAST BC REGIONAL PILOT STUDY

EARLY PLANNING → **ASSESSMENT** → **DECISION MAKING**

VESEL TRAFFIC AND ASSOCIATED EFFECTS KEEP ADDING UP AND UP

WHAT ARE THESE EFFECTS?

Some examples from discussions:

- Air and water quality are interconnected
- THE SHEER AMOUNT OF TRAFFIC
- POLLUTANTS
- BRINGS INVASIVE SPECIES
- AFFECTS MIGRATING SPECIES
- UNDERWATER NOISE
- SHADING
- Cultural activities like canoe journeys
- Sensitive Ecosystems
- LIMITS ACCESS
- Itchy Hearing
- Species of concern
- When the animals we live with & consider are affected we are too.
- INDIGENOUS COMMUNITIES LIVELIHOOD & CULTURE
- Our health is tied to the health of the environment
- HABITATS AND ECOSYSTEMS
- Our waterways are our lifelines

AND WHAT DO WE DO ABOUT IT?

IDENTIFYING PRIORITIES / THEMES TO INFORM MANAGEMENT

OCEANS PROTECTION PLAN (OPP) SHIP MOVEMENT AND VESSEL MANAGEMENT COORDINATING COMMITTEE (VMCC) MARCH 10th & 24th 2021

Collaborating to design assessment

- Ship movement and vessel management committee
- First Nations Fisheries Council
- Transport Canada

WHAT IS BEING AFFECTED?

Identifying priorities / themes to inform management

- Combining work from different gov. initiatives
- conducting the 2 separate
- Starting local, informing regional, considering global
- Using tools to weave knowledges
- OCAP
- Support docs on how to apply
- Respect
- Capacity funding for community participation
- Using tools to weave knowledges
- OCAP
- Support docs on how to apply
- Respect

VESEL TRAFFIC AND ASSOCIATED EFFECTS KEEP ADDING UP AND UP

WHAT IS BEING AFFECTED?

AND WHAT DO WE DO ABOUT IT?

IDENTIFYING PRIORITIES / THEMES TO INFORM MANAGEMENT

OCEANS PROTECTION PLAN (OPP) SHIP MOVEMENT AND VESSEL MANAGEMENT COORDINATING COMMITTEE (VMCC) MARCH 10th & 24th 2021

Collaborating to design assessment

- Ship movement and vessel management committee
- First Nations Fisheries Council
- Transport Canada

WHAT IS BEING AFFECTED?

Identifying priorities / themes to inform management

- Combining work from different gov. initiatives
- conducting the 2 separate
- Starting local, informing regional, considering global
- Using tools to weave knowledges
- OCAP
- Support docs on how to apply
- Respect
- Capacity funding for community participation
- Using tools to weave knowledges
- OCAP
- Support docs on how to apply
- Respect

CUMULATIVE EFFECTS OF MARINE SHIPPING Scoping Workshops 3 & 4

APRIL 28th 2021 & JUNE 22nd 2021

OCEANS PROTECTION PLAN (OPP) FIRST NATIONS FISHERIES COUNCIL (FNFC) SHIP MOVEMENT AND VESSEL MANAGEMENT COORDINATING COMMITTEE (VMCC)

EVERYTHING COMES BACK TO INDIGENOUS MARINE USE

Like our villages, the ecosystems are interconnected

The ocean is our refrigerator

The territory is our home

The depth of importance of seafood

SCOPING CRITERIA

Choosing what CONNECTION to concentrate on first by asking questions like:

- How does this connection affect ECOSYSTEM HEALTH?
- How is it CULTURALLY IMPORTANT?
- How does it support the community ECONOMICALLY?
- Is there AVAILABLE DATA?
- Are there TANGIBLE OUTCOMES?

WE ARE ON THE RIGHT TRACK

Learning from others

Learning as we go

How is the connection relevant to OUR NATION?

Are there TANGIBLE OUTCOMES?

CEMS SOUTH COAST REGIONAL PILOT PROJECT WORKSHOP 5

Welcome Back

INTRODUCTIONS

OPENING REMARKS

SUPPORT FOR OUR COMMUNITIES

Learning Together through the process

MARINE SHIPPING POLLUTION

CLIMATE change and DEVASTATION

WE CANNOT FORGET OUR SITUATIONS CHANGE QUICKLY

NO RIGHT OR WRONG WAY TO DEVELOP SCOPE & SCOPING CRITERIA

REVIEW INPUT + OUTCOMES FROM SCOPING WORKSHOPS

EVERYTHING IS INTERCONNECTED

CAN WE TAKE A HOLISTIC VIEW...

RELATIONSHIP WITH GOVERNMENT SHOULD BE EXAMINED ON ONGOING BASIS

BASELINE AND CONTEXT ARE IMPORTANT

CONNECT WITH NATIONS IN WASHINGTON

STAY UP TO DATE ON CURRENT RESEARCH COMMUNITIES

LEARNING FROM OTHER COMMUNITIES

Salmon

Rockfish + Sculpin

FISH

FOOD RESOURCE

SHORELINE HABITATS

IMPACT ON RIGHTS

SRKW

SEAWEED HARVESTING

CRAB HABITAT

Eelgrass BEDS

LOOK AT MARINE SHIPPING CONNECTION WHEELS

MORE DISCUSSION ongoing

CONSIDER COMMUNITY FUTURES

WE WANT TO FORWARD THINKING

CEMS SOUTH COAST WORKSHOP 6

Recap and INTRODUCTIONS

OUR NATIONS PROTOCOLS TO BE HONORED

KEEP OUR OCEANS PROTECTED

SELVES SUFFICIENT

HARVESTING INDICATORS FOCUS ON UNDERSTANDING HOW THAT IMPACTS THE LAND

CONSIDER AS AN OPTION QUALITATIVE DATA

CAPACITY MUST BE CONSIDERED SELF-DETERMINATION

KNOWLEDGE SHARING across various INITIATIVES in 2022 - e.g. SSI

METHODS FOR ASSESSMENT: WHAT IS THE FOCUS OF THE ASSESSMENT?

OBJECTIVES in our LIVING WORKPLAN help to stay on Track...

COMBINE OPTIONS 1 and 4?

TOP 10 CONNECTIONS FROM PRIORITIZED LIST

GROUP INTO LARGER CATEGORIES i.e. ENVIRONMENTAL

DEFINITIONS OF MARINE SENSITIVE ECOSYSTEMS, etc Needed...

PICKING & CHOOSING FROM A LIST IS TRICKY AND WE KNOW WE NEED PRIORITIES

ENVIRONMENTAL FOCUS SOCIO-CULTURAL LINKAGES

OUR OBJECTIVES Management Levels

LINKS TO OTHER INITIATIVES

ABILITY TO re-use OR Methodology

Capacity and Feasibility

WHATEVER OPTION WE CHOOSE IS THE RIGHT CHOICE

EXAMPLE MANAGEMENT LEVELS

- shoreline habitats
- crab habitats
- oyster beds
- glass sponge reefs
- e-sharps
- bivalve habitats

OUR SCOPE: MARINE HABITATS BREEDING GROUNDS SENSITIVE ECOSYSTEMS

EXAMPLE MANAGEMENT LEVELS

- VESSEL SPEEDS & SLOW DOWNS
- COLLISION REGS - CSA
- COMMUNICATION PROTOCOLS ETC.
- Ballast Water Regulations out of scope

BUILD TRUST, CONNECT & RELATIONSHIPS

WE LEARN FROM EACH AND EVERY COMMENT THAT IS MADE IN THESE SPACES...

VARIOUS GOVERNMENTAL OBJECTIVES (Indigenous + settler governments)

RELATIONSHIPS change over TIME

RIGHTS + TITLE

CONSIDER FOR EACH NATION