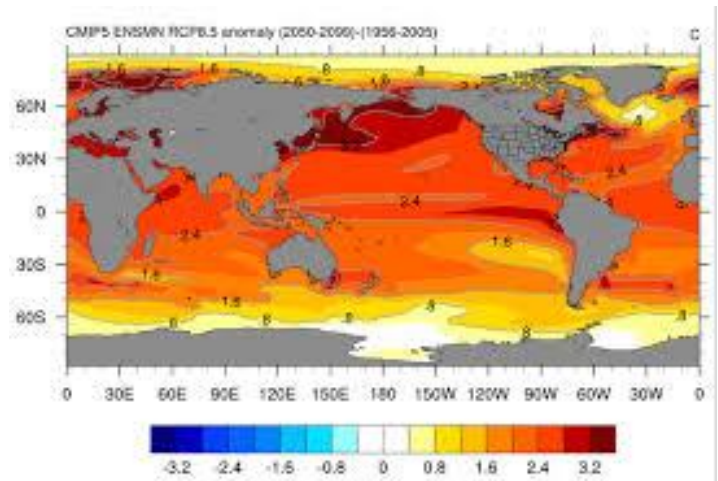
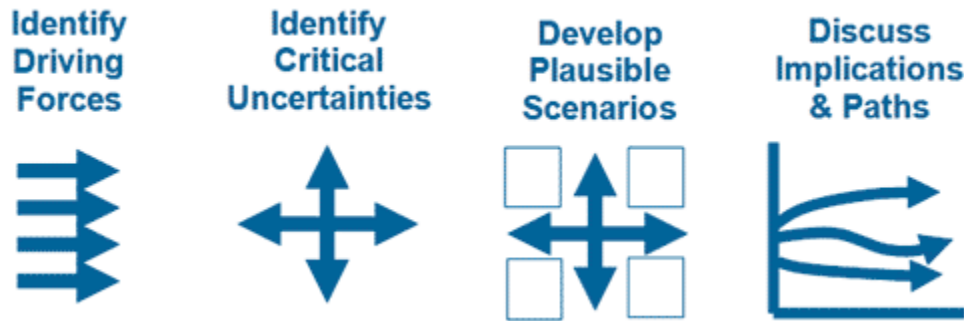


Scenario Planning Working Group

Findings and Recommendations for the Northeast Region
Coordinating Council



July 30, 2020

Northeast Region Coordinating Council Intercessional Meeting

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Scenario Planning Working Group (SPWG) and Process

The SPWG is as follows:

- Toni Kerns, Atlantic States Marine Fisheries Commission
- Dr. Sean Lucey, Northeast Fisheries Science Center
- Deirdre Boelke, New England Fishery Management Council
- Dr. Wendy Morrison, NMFS Headquarters/Office of Sustainable Fisheries
- Myra Brouwer, South Atlantic Fishery Management Council
- Kiley Dancy, Mid-Atlantic Fishery Management Council
- Emily Keiley, Greater Atlantic Regional Fisheries Office
- Mike Ruccio, Greater Atlantic Regional Fisheries Office (Chair)
- Lauren Bonatakis, NOAA Knauss Marine Policy Fellowship Program

Yvonne deReynier, Pacific Regional Office, Diane Borggaard, Greater Atlantic Regional Office, and Kit Dahl, Pacific Fishery Management Council provided significant detail from their experiences with past or ongoing scenario planning efforts. Kiley Dancy provided the work and presentation she gave the Mid-Atlantic Council at its April meeting. The SPWG is indebted to them for their contributions to our research and for their suggestions of what has worked in their experiences. Jay Odell, The Nature Conservancy, joined the June 30, 2020, SPWG call to discuss potential collaboration and funding opportunities for scenario planning. Mr. Odell has been involved in several subsequent discussions about funding and potential scenario planning processes.

The SPWG approach was to develop independent options for conducting climate change scenario planning that could be assembled together in multiple configurations to address the typical five-step process involving orientation, exploration, synthesis, application, and monitoring. For each of the independent options, the SPWG sought to provide a thorough evaluation for the Northeast Region Coordinating Council (NRCC) to consider. The SPWG provides recommendations for decision points and provides some alternative options for the NRCC to contemplate. The SPWG also highlights additional considerations for the NRCC and/or areas for further discussion and clarification should scenario planning move forward.

To gain some insight about other scenario planning efforts, the SPWG compiled information on other efforts involving marine or aquatic environments. In addition, the SPWG included the New England Council's recent Atlantic herring management strategy evaluation within this information gathering exercise given many similarities in process to potential scenario planning. The information on these scenario planning and other efforts is show in Table 1, below. Evaluation of other scenario planning work provided a valuable context for thinking about scope, scale, process, and structure for a potential Atlantic coast climate change-related planning exercise. Some of the processes reviewed were very short and highly focused; others were much longer and broader in scope. However, within the differences some components were consistent across efforts. These consistencies were also useful for the SPWG during its discussions.

Table 1. Summary of Scenario Planning Efforts Evaluated by the Scenario Planning Working Group.

Area/Location	Project	Convener(s)	Approximate Project Timeline	Scenario drivers/basic scenario development	Number of Workshops	Additional development, scenario, adaptation work	Participants/type	Facilitated?	Number of Scenarios Developed	Other information
Tijuana National Estuarine Research Reserve, California	Climate change impacts on sea level rise and riverine flooding	NOAA and National Estuarine Research Reserve System Science Cooperative	2 years	Core team	2 day long, in-person	1-on-1 interviews	60	Yes	4	
Great Barrier Reef Catchment, Australia	Attempt to reverse water quality decline and realize benefits	Commonwealth Scientific and Industrial Research Organization	unknown	Core team	1	Project team interviewed experts, stakeholders	47 experts, 41 stakeholders	Yes	4	
Rhode Island Marine Fisheries	Resilient Rhode Island Fisheries	Grassroots decentralized effort	3 years	Core team	1	48 interviews	125 industry	Yes	4	2-10 hour seminars on identified topics (outreach/education prior to workshops)
Barents Sea, Norway	Impact of climate change on Barents Sea commercial fisheries	Euromarine, Norwegian Institute of Marine Research	Unknown	Core team	1 (3 days)	Perspectives developed during workshop	18 from industry, fisheries policy, NGOs, fisheries research	No	3	
Yukon Territory, Canada	Wildlife management goals in rapidly changing social-ecological system	University of Saskatchewan	1 year	Participants	3 (1-2-1 day format)		15 total, 6 to 9 per workshop session (all natural resource managers from the region)	No	4	
Apostle Islands, Wisconsin	Park preparation and impacts of climate change	National Park Service	3 months	Core team	1 day long		38 mostly from government agencies and academia	yes	4	
Gulf of Maine	Atlantic Salmon resiliency improvement during climate change	NOAA/NMFS	1 year	Core Team was 3 (NMFS HQ, NMFS GARFO, Facilitator); Participants	2 webinars, a 2-day workshop		22 Federal employees	yes	4	

Table continues below

Area/Location	Project	Convener(s)	Approximate Project Timeline	Scenario drivers/basic scenario development	Number of Workshops	Additional development, scenario, adaptation work	Participants/type	Facilitated?	Number of Scenarios Developed	Other information
Pacific Coast	Climate Change Scenario Planning for West Coast Fishing Communities in 2040	Pacific Fishery Management Council	Ongoing since October 2018	Climate and Communities Core Team (Ad hoc Council Committee)**	1 (so far)	21 factors identified that may shape fishing communities to 2040	80; mix of scientists, fishery experts, stakeholders, tribes	yes	4	The Nature Conservancy jointly sponsored 1st workshop; Additional meetings/development occurs through Council processes
Atlantic Coast	Impact of climate change on North Atlantic Right Whales	NOAA/NMFS	5 months	Core team was 4 (NMFS HQ, NMFS GARFO, NMSE SERO, Facilitator)	2 webinars, 2 multi-day workshops		32 Federal employees+ 4 core team	yes	4	
Atlantic Coast	Atlantic Herring Management Strategy Evaluation	New England Fishery Management Council	2 years	Two teams: Steering Cttee focused on big picture, process; Technical team focused on analysis and results	2		65+: Fishermen, recreational anglers, scientists, managers, NGOs	yes	N/A	Open process: Two specific MSE workshops; however, multiple Council-related meetings including PDT, AP, Committee, Council, and peer review

**The core team is an ad hoc Pacific Council committee with 10 members, plus Kit Dahl (Council staff) and Jonathan Star (facilitator). This includes 3 Council members, 5 members of ecosystem advisory groups (2 from ecosystem advisory subpanel and 3 from the ecosystem workgroup), and 2 science center staff:
Caren Braby, Oregon Department of Fish and Wildlife (Council member)
Yvonne deReynier, NOAA Fisheries West Coast Region (Ecosystem Workgroup)
Richard Lincoln (Council Member)
Tommy Moore, Northwest Indian Fish Commission (Ecosystem Workgroup)
Corey Niles, Washington Department of Fish and Wildlife (Ecosystem Workgroup)
Corey Ridings, The Ocean Conservancy (Ecosystem Advisory Subpanel)
Gway Rogers-Kirchner, The Nature Conservancy (Ecosystem Advisory Subpanel)
Jameal Samhour, NOAA Fisheries (Northwest Fisheries Science Center)
Stephen Stohs, NOAA Fisheries, (Southwest Fisheries Science Center; HMS Management Team)
John Ugoretz, California Department of Fish and Wildlife (Council member)

Why conduct scenario planning?

Scenario planning is a tool that managers can use to test decisions or develop robust strategies in a context of uncontrollable and uncertain environmental, social, political, economic, or technical factors. In the case of the NRCC, conducting an east coast scenario planning exercise may provide an opportunity to evaluate challenging climate change related management issues in a changing ocean environment across multiple Council and Commission jurisdictions. Oteros-Rozas et al., (2015) found in a case study of 23 scenario planning efforts that the processes enhanced stakeholder engagement, provided diversity and equity in decision making, fostered creativity and social innovations from stakeholders.

Difficult governance decisions are necessary complex environmental factors influence things like productivity and stock distribution. Scenario planning can be a useful tool in not only exploring and describing multiple plausible futures, but also to advance discussion or inform potential governance structure when scenarios are realized. Scenario planning can consider broader forces in the world such as societal change, climate and environmental change, and changes in the policy and legal environment, and considers how these drivers that are outside of the organization's control may affect organizational priorities. Scenario planning forces participants to explore their underlying assumptions and perceptions about the range of possible future conditions. It reduces the tendency for managers to become overconfident in their expectations of future conditions, too focused on a limited view of the future, or paralyzed by uncertainty. Scenario planning provides a way to organize complex information about changing conditions and stimulates creative and innovative thinking about how to prepare for change.

It provides space for out of the box thinking, disconnected from the normal regulatory processes where participants can develop different future states and the tools and processes necessary to respond to those states. It has substantial utility in providing space to view problems from different perspectives and discuss novel solutions and reach compromises. Such an exercise could prove valuable for informing management and research needs, provide for proactive thinking and planning, and identify plausible future actions in a context that allows all groups involved to be well positioned to be collectively ahead of the curve instead of merely reacting to new and dynamic information as it occurs. Moreover, it provides an opportunity to explore not one but many plausible futures, further allowing managers to understand the limitations of current systems that may not be nimble enough to respond to change. Managers can use the resulting scenarios to prioritize near-term actions that are likely to be beneficial under a range of future conditions and by planning to avoid actions that may reduce flexibility or increase the difficulty of adapting to future conditions. It can also provide insights into data gaps and monitoring needs for changing conditions.

However, there is a cost to such work. Ideally, all the NRCC member organizations would have staff involved, should a broad east coast scenario planning process move forward. Conducting scenario planning will require time and commitment of resources that will compete directly with other ongoing or planned activities within NRCC member portfolios. There may be actual costs pending decisions on facilitation, meetings, and process but the greatest cost comes in the form of time and process investment. Moreover, it is not a panacea; issues that arise in scenario planning will still require managers to make difficult decisions, and potential actions that span multiple Atlantic fishery management jurisdictions. Scenario planning can help inform these decisions or potentially even outline the management and governance responses, depending how the process is conducted.

NRCC Decision Points

From this point forward in the document, the SPWG has identified decision points for the NRCC nested within specific sections/topics. For each decision point, additional information is provided within each section to identify, to the extent possible, critical components of the topic that should provide context to discuss pros and cons. Additional discussion is provided under each sub-heading.

Phase 1: Pre-planning

The National Park Service’s five-step process for scenario planning (National Park Service, 2013) may not fit precisely for the NRCC, given that the discussion is exploratory in nature and while the topic has been generally identified, the process details have not yet been decided. To accommodate this, the SPWG has developed a series of “pre-planning” decisions that the NRCC should consider. The pre-planning phase could be iterative pending the outcome of the NRCC’s July 30, 2020, intercessional meeting. The SPWG recognizes there are several potential outcomes from the intercessional that range from immediate initiation of a scenario planning exercise to deferring any decisions until a subsequent NRCC meeting and/or further consideration of scenario planning in each respective member’s annual planning and prioritization processes. The SPWG has attempted to present information in a manner that can accommodate any and all of these potential outcomes; however, readers are cautioned to bear in mind that the pre-work phase structure is necessarily very broad in description to accommodate these potential outcomes.

In the *Scenario Planning Handbook* (National Park Service, 2013), substantial emphasis is given to clearly establishing goals of scenario planning projects. Beyond this, the *Handbook* also stresses that scenario thinking can be put into practice in many ways, so the NRCC should bear in mind that scenario planning can be adapted and modified, as needed, to fit goals and needs. There is not ‘right’ approach in this regard.

Table 2. Potential NRCC Climate Change Scenario planning process based loosely on the steps described in NPS (2013)

	Goal	Steps	Outcomes/Products	Who/What
Phase 1: Pre-Planning	Decide on important structural, participation, and process components for project.	<ul style="list-style-type: none"> Investigation of scenario planning options by Scenario Planning SPWG (SPWG) SPWG provides decision matrix and recommendations to NRCC Determine basic structure of process (use of a core team, what organizations are involved, etc.) Outline next steps, including responsible group(s) 	<ul style="list-style-type: none"> Road map identifying how NRCC’s scenario planning exercise will be conducted including identification of participants, process, and other resources needed for effort 	<ul style="list-style-type: none"> Ideas presented by SPWG (July 2020) NRCC provides feedback on decision matrix and guidance on possible additional exploration

Table continues

Phase 2: Orientation	Set up project for success	<ul style="list-style-type: none"> Establish guidance team construct Establish ad hoc Committee (if used for process) <ul style="list-style-type: none"> Develop and execute facilitation contract Establish process, purpose, and scope of project <ul style="list-style-type: none"> Determine type of desired outcomes Specify focal issue (strategic challenge) to explore 	<ul style="list-style-type: none"> Decision on partnership with The Nature Conservancy <ul style="list-style-type: none"> Hire outside scenario planning expert/facilitator An understanding of the purpose, desired outcomes, focal issue, and scope of project <ul style="list-style-type: none"> Establishment of core team 	<ul style="list-style-type: none"> NRCC gives green light to move forward Guidance team with input from NRCC (others) and initiates project.
Phase 3: Scoping	Gain wide-perspectives of input on focal issue	<ul style="list-style-type: none"> Work with core team and facilitator to conduct structured outreach 	<ul style="list-style-type: none"> Synthesize public and stakeholder input for further use in process Introduce stakeholders to scenario planning and potential application in this context 	<ul style="list-style-type: none"> Core team, facilitator, interested stakeholders and public
Phase 4: Exploration	Identify and analyze drivers, variables, trends, and uncertainties	<ul style="list-style-type: none"> Identify drivers, variables, and uncertainties from interviews with experts, core team, public input results Identify potential impacts 	<ul style="list-style-type: none"> Tables, conceptual models, charts, graphics, or maps that capture drivers, variables, or uncertainties 	<ul style="list-style-type: none"> Core team, facilitator
Phase 5: Synthesize & Create Scenarios	Produce small number of scenarios using critical drivers and potential impacts identified in Phase 4	<ul style="list-style-type: none"> Determine critical uncertainties with large impact on focal issue Build scenario frameworks and choose scenarios Develop scenario narratives Review scenarios for plausibility 	<ul style="list-style-type: none"> 3-5 plausible, relevant, challenging and divergent scenarios using critical uncertainties to inform, inspire and test actions/strategies 	<ul style="list-style-type: none"> Core team works with input from NRCC, others. Possible workshop to create scenarios
Phase 6: Implementation or application	Answer “So what?” questions: What are the impacts of these plausible futures? What can we do about it?	<ul style="list-style-type: none"> Identify scenario implications Develop, test and prioritize management actions Use scenarios to inform management strategies 	<ul style="list-style-type: none"> List of actions, strategies, or areas for additional research based on discussions initiated by scenarios 	<ul style="list-style-type: none"> Core team works with input from NRCC, others. Workshop to understand management implications
Phase 7: Monitoring	Identify important indicators (trigger points) that can signal changes in the environment as future unfolds	<ul style="list-style-type: none"> Select indicators to monitor Monitor environment changes 	<ul style="list-style-type: none"> List of indicators and early warning signals for continued research and monitoring <ul style="list-style-type: none"> A monitoring strategy 	<ul style="list-style-type: none"> Core team works with input from NRCC, others

Pre-planning decision points

The SPWG assumed that the NRCC would be the ultimate decision-making group for scenario planning. The document has been structured around that assumption. However, as outlined in the potential pre-planning diagram above, it is possible that individual organizations may also be part of the overall scenario planning decision process. Furthermore, should some but not all of the NRCC elect to participate in a scenario planning exercise, these recommendations could be modified to be used by those groups that do elect to develop scenario planning.

In the pre-planning phase, the SPWG identified the following decision points and is providing the following recommendations for each.

Table 3. NRCC Scenario Planning Decision Matrix and Working Group Recommendations. The Cost row associated with each topic is the relative cost to participating groups.

Topic								SPWG Recommendation
Technical Development and Planning Oversight Structure	Options	1. Core Team	2. Core Team Plus	3. Ad Hoc Committee	4. Rely on Facilitator	5. Fold into existing Council and Commission Structures	6. Hybrid of several options	1. Core Team
	Description	Appoint a topic-specific Core Team comprised of NRCC member group technical staff and others, as desired by NRCC (similar to SPWG)	Individuals that would staff a PDT or FMAT-type structure and/or identify staff lead(s) to handle core team functions; add Council or Commission member(s) as Chair or co-chairs	Develop an ad hoc committee that is a mix of technical staff, Council/Commission members, SSC, Advisory Panel	No specific group constructed beyond points-of-contact to work with facilitator (necessitates using external facilitator)	Existing groups (e.g., Ecosystem or Ecosystem/Ocean Planning Committees with technical staff) could be used	Potentially reporting to someone or structure (i.e., Core Team reporting to Committees or NRCC?)	Appoint core team of NRCC membership technical staff; appoint chair or chairs; determine if additional participants are desired in core team and, if so, identify process for selection
	Cost	\$	\$	\$\$	\$\$\$	\$\$		
Facilitation	Options	1. Full facilitation and process support	2. Facilitated workshops plus limited additional planning assistance	3. Facilitated workshop only	4. No facilitation			1. Full facilitation and process support
	Description	Hire a professional facilitation with expertise in scenario planning to assist in all phases of the process, meeting logistics, surveys (if used), etc.	Hire a professional with expertise in scenario planning but structure contract to limit assistance to specific components of the process (e.g., help with specific orientation component and facilitate workshops)	Self-explanatory: Facilitator would only conduct workshop(s); remainder of work would be handled by core team	Self-explanatory: No facilitator would be involved in the process; work would be handled by core team and/or other identified groups			Involve a professional with expertise in both scenario planning and facilitation
	Cost	\$\$\$\$	\$\$\$	\$\$	\$			

Table continues below

Scenario Development Process and Public Participation	Options	1. Technical Staff Only	2. Technical Staff + Council/Commission/NMFS Appointees		3. Ad Hoc Committee	4. Full Council Committees + Commission Group	3. Ad Hoc Committee
	Description	Small appointed working group of existing technical staff. Could be as small as 5 or as large as desired	Expanded group that includes technical staff and additional appointees from all NRCC groups	Develop a formal ad hoc committee that is a mix of technical staff, Council/Commission members, Scientific and Industry Advisors	Fold into existing standing committees and groups (e.g., Ecosystem or Ecosystem and Ocean Planning Committee)		Create and ad hoc committee of Council/Commission members, technical staff, and scientific and industry advisors (as needed); discuss and agree on governance structure for committee. Conduct scoping or outreach effort to increase potential public engagement
	Cost	\$	\$	\$\$	\$\$		
Funding	Options	1. No specific funding identified	2. Outside contribution (e.g., TNC)	3. Identify specific funds or grants			2. Outside contribution
	Description	Existing Council and Commission grants that pay salary, travel, reimbursements would be used; NMFS staff would use existing appropriated Federal funds	Reliance on significant external funding source(s) to satisfy much of the contractual costs (e.g., meeting space, facilitation, potentially interviews, report writing)	NOAA Climate Initiative, MSA Funds RFP,			Accept TNC's offer to collaborate and make use of external grant money alongside use of existing Council/Commission/Agency resources, as needed
	Cost	\$\$\$	\$		TBD		
Timeline	Options	1. Single workshop: 12-24 months	2. Two workshops: 18-36 months	Sub-option A: Immediate initiation of project	Sub-option B: Additional pre-work; initiate after Fall NRCC discussion	Sub-option C: Initiate after Council and Commission fall priority setting discussions	2. Two workshops; 18-36 months
	Description	See <i>Scenario Planning Handbook</i> for details	See <i>Scenario Planning Handbook</i> for details	These are really at the NRCC's discretion and comfort with the potential project.			Scenario planning will occur alongside additional work, some with higher priority, using a two workshop, longer format, may better ensure a robust but manageable process occurs
	Cost	\$\$	\$\$\$				

Technical Development Process and Oversight

The SPWG recommends the NRCC adopt and appoint a core team to conduct the majority of the work and logistics behind a scenario planning process. This would be very analogous to using a plan development team (PDT) or a fishery management action team (FMAT) in planning and developing a fishery management action. Simply substitute “scenario planning” for “fishery management action”. The core team would develop documents, analyses, and conduct meeting logistics and planning.

In evaluating other scenario planning efforts and similar large-scale efforts such as the Atlantic herring management strategy evaluation process, the SPWG notes that use of a core team has been a consistent approach. This is with good reason. The majority of core teams have been a mix of technical subject matter experts, facilitators, and/or constituents with vested interests and specific knowledge of the issue being evaluated. As such, these individuals are well equipped to provide the mix of technical information, conduct planning, and develop information necessary to conduct a robust scenario planning process that resonates with stakeholders, the public, and policymakers. The core team will be involved with every phase and nearly every aspect of planning, development, synthesis, reporting, implementation, and monitoring.

The NRCC should discuss if the core team should be vetted through participating organizations or if the appointment process should occur through normal NRCC proceedings.

Additional important discussion components for the NRCC to consider for the core team are size and composition. In table 1, the size of core teams has varied from 3 in the Atlantic salmon process to an ad hoc committee of 12 in the Pacific Council’s comprehensive scenario planning process.

The SPWG preferred approach is a smaller core team with technical staff from each organization with or without participation of a professional facilitator (facilitation is discussed in the next section). This may still be seven individuals if appointees include the three Councils, Commission, Regional Offices, and Science Centers and a facilitator. This is very similar to the composition of the SPWG.

Finally, regardless of what core team structure is adopted, the NRCC or individual organizations should discuss governance, public participation, meeting notice and other practical logistical items. For example, it would be good to clarify if the core team reports to the NRCC, Councils/Commissions, standing committees, etc.

Facilitation

The SPWG recommends that a professional facilitator with experience in scenario planning be hired and participate in as much of the scenario planning process as is possible given available budget. The facilitator will interface frequently with the core team.

While capacity to lead scenario planning is being developed “in house”, the SPWG noted that such development is in early days for Agency and Council staff. Given the potential scope and scale for this project, a more comprehensive process and outcome is likely if a professional facilitator is involved with the planning and execution of the process, inclusive of workshops. The SPWG recognizes that this effort may delve into stakeholder values that may be emotionally charged. Facilitation helps ensure that each value is articulated, acknowledged, and used in deliberation or alternative comparisons. In addition, when the scenario planning process is poorly implemented it can have lasting negative impacts beyond the scope of the project. A trained facilitator can help ensure positive stakeholder engagement in the process.

Alternatively, if overall funding is constraining, the SPWG recommends that a facilitator be involved with workshop planning and execution. Any components of the process that a facilitator is not available, the SPWG assumes that responsibility would fall to whatever core team construct is used.

Process and Structure for Stakeholder Participation

The SPWG recommends that an ad hoc committee be formed by the NRCC membership to conduct the scenario planning process. This would be analogous to the ad hoc committee created for things like the Standard Bycatch Reporting Methodology (SBRM). SBRM was a cross-jurisdiction issue involving both the New England and Mid-Atlantic Councils. An ad hoc committee for scenario planning would provide a conduit for public participation, discussion, advancement of topic and issue development (analogous to any fishery management action development with the Councils or Commission). The ad hoc committee would interface with the core team and facilitator to give direction and feedback, including that obtained from public participation and comment.

The SPWG discussed that ‘process’ is a very wide description for the general overall approach on how engagement and development in scenario planning may occur. To be clear, the core team and/or a facilitator may provide substantial input or may unilaterally develop the process that occurs in phases 2-7 of table 2. A preliminary discussion of process options is presented for the NRCC to review and discuss as any preferences or other guidance would be informative moving forward.

Much like the discussion for core team, the NRCC or individual member organizations should discuss and identify what the committee membership should be. The SPWG discussed that existing ecosystem and ocean planning committee chairs may be a good fit along with technical staff, agency appointees, and potential inclusion of advisors or scientific/technical committee members. A chair or rotating chair along with co-chair(s) should be established if this model is selected.

For contrast, the process used for Atlantic salmon and North Atlantic right whale scenario planning was much smaller, and much less representative of the NRCC membership. The process for these scenarios was conducted entirely by Federal employees (regional office, headquarters, and science center staff). While there would be potential transparency issues, a smaller group or subset of member organizations could be used to conduct the scenario planning process. Consultation with a facilitator may be informative on optimal size of process-related meeting groups.

Regardless of what type of process is used, the SPWG discussed the importance of engagement with the public, and providing opportunities for participation. Participation could occur through the ad hoc committee process; one that the SPWG would envision may result in providing updates to the full Councils and Commission for further public discussion.

Important opportunities for public participation can also occur in scoping, exploration, and synthesis. There may be value in engaging stakeholders above and beyond the ad hoc committee process or in a more focused way than a general committee meeting format. The SPWG also recommends some type of scoping or outreach process to gather public input that would inform process, and the exploration and synthesis phases that feed into workshops. Again, a facilitator may have suggestions on process, inclusion, or ways to gather input. Research into the scenario planning process has found that high levels of public participation, while resource intensive, can improve results (Oteros-Rozas et al. 2015). For example, they found the quality of the scenarios and subsequent management advice were improved when the process included knowledge and information from a diversity of stakeholders. They also noted that stakeholder acceptance of the policy changes can be increased when stakeholders provide input into the scenarios and scenario planning process. Thus, the SPWG

recommends strong consideration of when and how stakeholders are involved in and contribute to any scenario planning project.

Funding

The SPWG recommends the NRCC accept The Nature Conservancy's (TNC) offer to partner in conducting scenario planning. TNC is in the process of securing a substantial grant to conduct scenario planning. It is clear that there are some potential complications in having an outside grant potentially provide funding for travel, per diem, and other expenditures normally covered by Council grants or appropriated budgets for Agency staff. Unless a third party can be involved to make use of this grant funding and such an approach is deemed acceptable by NOAA General Counsel, it is expected Council, Commission, and agency personnel would have their respective participation costs paid by their organization. The TNC grant could be used to pay for facilitation, meeting facilities or technology contracts for remote meeting platforms, potentially public invitational travel, and other miscellaneous expenditures such as printing, outreach, or scoping surveys.

Absent collaborating with TNC, no additional specific funding opportunities were identified by the SPWG. There is the potential for NOAA Climate Planning Initiative funding to materialize and there are non-specific climate-specific grant funding opportunities that arise from time to time. However, at the time of the SPWG evaluation, there were no specific avenues to pursue with these types of opportunities.

The only other viable funding would then be execution of scenario planning within existing Council and Commission funding along with existing agency funding.

Timeline

The SPWG recommend that the NRCC endorse a two-workshop model. The remaining components of timeline depend wholly on when the NRCC may choose to initiate phases 2 through 7 (table 2). The process could be initiated this summer. Alternatively, if the NRCC needs additional information, time to deliberate, or even a delay for each member organization to consider scenario planning in individual priority-setting processes, the start of the timeline could be delayed until spring 2021.

As for the duration of the project, the SPWG believes the core team and/or facilitator can provide a more robust estimate of such a timeline once the process has been initiated. It would be valuable if the NRCC has any particular guidance on timing. For example, if the desire is to complete the process within a year of initiating the project, etc.

The most common construction for scenario planning consists of one or two workshops in conjunction with the lead time (6-8 weeks) for establishing the project and issue exploration, a period of scenario research, refinement, and validation (6-8 weeks) followed by ongoing scenario deliverables, implementation, and monitoring. At a minimum, in a single workshop process, the *Scenario Planning Handbook* (National Park Service, 2013) outlines a 16-week process. This provides a general overview of a highly focused one workshop scenario planning effort. Evaluation of other scenario planning efforts (Table 1) ranged from 3 months to 3 years.

Literature cited

National Park Service, 2013. *Using Scenarios to Explore Climate Change: A Handbook for Practitioners*. National Park Service Climate Change Response Program. Fort Collins, Colorado.

Oteros-Rozas et al. 2015. Participatory scenario planning in place-based social-ecological research: insights and experience from 23 case studies. *Ecology and Society* 20(4): 32.