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# COLLABORATING FOR COASTAL RESILIENCE: STAKEHOLDER ASSESSMENT AND PERCEPTION OF INTERDEPENDENCE IN SEABROOK, NH

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COLLABORATING FOR COASTAL RESILIENCE: STAKEHOLDER ASSESSMENT AND  
PERCEPTION OF INTERDEPENDENCE IN SEABROOK, NH

BY

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B.S., Cornell University, 2013

THESIS

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### Committee Page

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## ABSTRACT

### COLLABORATING FOR COASTAL RESILIENCE: STAKEHOLDER ASSESSMENT AND PERCEPTION OF INTERDEPENDENCE IN SEABROOK, NH

by

Emily Bialowas

University of New Hampshire, September, 2017

Like many coastal communities, the beach and dune ecosystems in Seabrook, New Hampshire are vulnerable to storm surge, sea-level rise, and extreme weather. Fostering coastal resilience in Seabrook requires local, regional, state, and federal stakeholders to collaborate on a broad range of issues. According to alternative dispute resolution (ADR) theory, stakeholders need to recognize their interdependence to be willing to collaborate. Interdependent stakeholders are aware their interests cannot be met by working alone and that their independent actions impact one another through complex social and ecological feedback loops. ADR practitioners often conduct a stakeholder assessment (SA) as a first step in a collaborative process to evaluate the feasibility of a collaborative solution and propose an appropriate process design. In the ADR literature, little attention has been paid to the impacts the SA itself might have on participants' perceptions. My research analyzes whether participation in a SA affects participants' perceptions of interdependence. First, I surveyed and interviewed ADR practitioners about their practice and experience using stakeholder assessments. I found practitioners use SA for the same reasons described in the literature. Compared to the literature, ADR practitioners have a more flexible approach to the interview process and how results are reported back to stakeholders. Practitioners also discussed instances of SAs when participants seemed to increase their perceptions of interdependence by either broadening the scope of issues they considered relevant in a conflict or considering ways to meet their own interests by meeting the interests of others through integrative solutions. Next, I conducted a stakeholder assessment in Seabrook, NH on dune and beach management issues. The stakeholder groups identified include the Town of Seabrook and Rockingham County, the Seabrook Beach Village District, New Hampshire state agencies, Federal agencies, and the University of New Hampshire. Key issues for beach and dune management include dune protection, wildlife and habitat protection, beach access and recreation, and harbor dredging. The assessment recommends (1) convening an advisory group with representatives from all major stakeholder groups to work on providing input for Seabrook's 2019 beach management plan update, (2) forming a subgroup to determine if Seabrook wants to use harbor dredge material for nourishment of Seabrook beach, (3) forming a subgroup to address gaps in scientific knowledge, outreach needs, and funding needs, and (4) reconvening the advisory group periodically to consider longer-term tasks and respond to new challenges. Finally, I conducted pre- and post-surveys to determine whether the Seabrook stakeholder assessment had an impact on participants' perceptions of interdependence. My findings, which by necessity were based on limited survey results, support my hypothesis that participating in an assessment increases participants' perceptions of interdependence, both in the issues they consider relevant and the other parties with whom they need to work.

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## **Chapter 1**

### **Introduction**

#### **1.1 Context**

Communities across the United States and beyond are striving to make their coasts more resilient to climate change impacts, including sea-level rise and increasing storm frequency and storm surge. For example, New Hampshire's coastal municipalities are working to implement recommendations from the New Hampshire Coastal Risk and Hazards Commission report, *Preparing New Hampshire for Projected Storm Surge, Sea-Level Rise, and Extreme Precipitation* (NHCRHC, 2014). However, implementing strategies to enhance coastal resilience is complex, as a large range of interdependent issues and stakeholders are involved. Collaboration is therefore needed to successfully build coastal resilience.

Alternative Dispute Resolution (ADR) is an approach whereby parties attempt to reach agreement while avoiding litigation. The conflicts ADR can address range from small two-party disputes to large public conflicts where at least one party challenges a decision because it conflicts with their interests. ADR includes both unassisted negotiation, where there are few issues to address and parties can communicate effectively without assistance, and assisted negotiations, which include mediation, arbitration, and facilitation, where a third-party works with the disputing parties to facilitate meetings, communication, or development of an agreement (Susskind & Cruikshank, 1987). A collaborative process is an interest-based approach to negotiation in which parties seek to find integrative solutions that meet the needs of all stakeholders (R. Fisher, Ury, & Patton, 2011). An integrative solution is mutually beneficial and is sometimes referred to as a "win-win" outcome.

According to the literature on environmental ADR, collaboration is more likely to be successful under certain conditions, including following a structured process, conducting a stakeholder assessment (SA), and stakeholders recognizing their interdependence. SAs are used to prepare for collaborative processes. The assessment helps to ensure that the right stakeholders are engaging in the process and that each can have their interests represented (L. Susskind & Thomas-Larmer, 1999)

Collaborative processes have several key steps. To initiate the process, a convener puts forth a mandate for a collaborative process (L. Susskind & Thomas-Larmer, 1999) (Figure 1.1). A stakeholder assessment is conducted to determine if collaboration is appropriate and if so, how to proceed. The stakeholder assessment is essentially the planning step of the collaborative process, gathering information to inform design, and allowing key stakeholders to prepare their interests and tactics. This allows stakeholders to come together to brainstorm and deliberate according to the design (Reed, 2008; Sobel, 2000; L. Susskind & Thomas-Larmer, 1999). Brainstorming is an opportunity to create value in the system. Parties share their interests and information and work together to create options to meet as many interests as possible. Brainstorming is followed by deliberation, which is an opportunity to distribute value and choose between the options created in the previous steps (Mnookin, Peppet, & Tulumello, 2000). The process is completed when parties reach an agreement on how to distribute value and how they

plan to follow through on their shared decision.

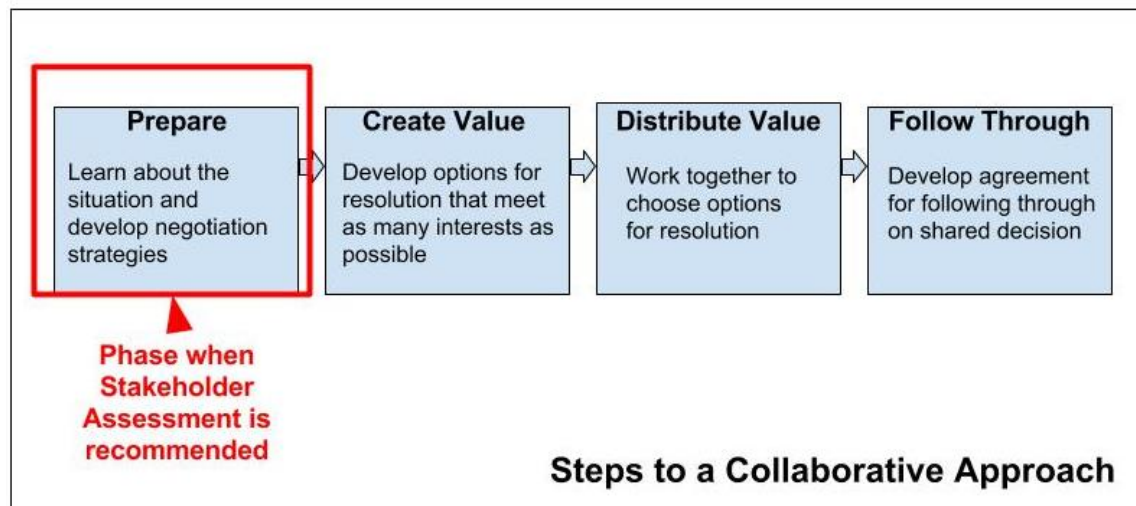


Figure 1.1. The recommended steps for a collaborative process. This diagram is adapted from *Consensus Building Institute, 2003*.

Stakeholders may care about a wide range of issues and have diverse interests and values. They are often unaware of how interconnected social and ecological issues are, how reliant they are on others to achieve their goals, and what opportunities exist to collaborate with others. Feelings of interdependence can be fostered when stakeholders sit down together during the collaborative process and jointly define a problem (Waayers, Lee, & Newsome, 2012). Stakeholders beginning to define interests and consider the aspects of a conflict can start to become aware of their interdependence (S. Selin & Chavez, 1995). It is possible for stakeholders to change how they perceive their interdependence through participating in a collaborative process (Innes & Booher, 2003; S. Selin & Chavez, 1995). However, there has been little evaluation of how SAs, the first step in a collaborative process, affect stakeholders' recognition of their interdependence.

Therefore, my Master's research has several objectives:

- 1) Conduct a Stakeholder Assessment to analyze the potential for collaboration to enhance coastal resilience in Seabrook, NH;
- 2) Understand how and for what purpose practitioners use SAs, including any efforts to foster interdependence; and
- 3) Evaluate the effect of the SA in Seabrook, NH on stakeholders' perceptions of interdependence.

## **1.2 Seabrook, NH**

The threats facing Seabrook, New Hampshire (NH) are typical of those facing many New England coastal communities and past reports indicate Seabrook needs to plan for expected sea level rise and storm surge (Rockingham Planning Commission, 2015; Appledore Engineering, 2004). Sea levels in NH are expected to rise between 1.7 and 6.3 feet by the year 2100. The current 100-year floodplain in Seabrook Beach is expected to be 85% inundated at 1.7 foot sea level rise and 94% inundated at projections of 6.3 foot sea level rise (NHCRC, 2014).<sup>1</sup> Like many coastal communities, the homes at Seabrook Beach, many of them seasonal vacation homes, are an important part of the Town's tax base. Beach properties currently provide 45% of the residential tax base for the town (Seabrook Tax Assessor), which is expected to increase as tax revenue declines from a local nuclear power plant, Seabrook Station. In addition to its homes, some of Seabrook Beach's roads will also be flooded, cutting off access between beach residents and Town of Seabrook emergency services (Rockingham Planning Commission, 2015). At the same time, Seabrook Beach is home to the most intact dune system in NH. The dunes are over

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<sup>1</sup> The 100-year floodplain is the area that would be flooded by storm surge should a significant hurricane or nor'easter hit Seabrook.

200 feet long and 30 feet tall at their greatest extent and help protect the beach residents from flooding associated with large storms and waves.

Like many coastal communities, Seabrook's beach and dune system are made up of both public and private resources and involve many issues and diverse stakeholders with different priorities, making management decisions difficult and potentially contentious. Purchased in 1978 from private homeowners, the dunes south of Hooksett Street to the Massachusetts border are owned by the Town of Seabrook. The Town is therefore responsible for beach maintenance; the Seabrook Beach Village District is responsible for zoning in the surrounding neighborhood. In addition to public walkways maintained by the Town, many private properties maintain private pathways across the dunes and some landowners have encroached over their property lines onto the dunes. Visitors, children, and dogs alike enjoy recreating in the dunes, which can negatively impact American beachgrass (*Ammophila breviligulata*). Beachgrass helps to build up sand dunes and stabilize them from the erosional effects of storm winds and surges. Recently, beachgrass die-off has been identified in Seabrook, potentially threatening the integrity of the dunes. After a recent dredge of Seabrook and Hampton Harbors in late 2012, the Army Corps of Engineers nourished Seabrook Beach with sand from the bottom of the harbor. The newly deposited sediment improved nesting habitat for the endangered Piping Plover (*Charadrius melodus*). US Fish and Wildlife Service (USFWS) and NH Fish and Game (NHFG) are responsible for protecting the plovers and their habitat, which requires restricting beach access during the nesting season. These restrictions have been viewed as a nuisance by beach visitors and residents.

Past efforts to develop a dune management plan have not been implemented. The most recent dune management planning effort (Appledore Engineering, 2004) took place over a

decade ago, was funded by National Oceanic and Atmospheric Administration (NOAA) and the NH Coastal Program, but had little local support. Although completed in 2004, the Town of Seabrook did not approve it until 2015, and residents I spoke with indicate little intention to implement the plan.

However, the assessment I conducted as part of the *Human and Ecological Interactions in Dune Systems* research project, indicates stakeholders are interested in collaborating toward several coastal resiliency goals, including a new beach management planning effort, beach nourishment, and addressing scientific gaps in understanding dune and beach sand dynamics and beachgrass die-off. The issues and conflicts over priorities in Seabrook is an upstream conflict, meaning that stakeholders see the issues as important, although not urgent, and tensions are low. Stakeholders with differing interests in the dunes and beach may be able to find common ground on how they would like to see the resource managed.

### **1.3 Stakeholder Assessments**

Stakeholder assessments (SAs) are an opportunity to identify all of the stakeholders in a particular situation and determine the issues important to them. The assessment is prescribed as the first step in a collaborative process (Figure 1.1), in order to determine an appropriate process design, which should include the right players and focus on the set of issues they care about (Sobel, 2000). It is also an important first step because the assessment may conclude that a successful collaborative process is unlikely or not possible. This could be because stakeholders are not willing to engage in good faith with one another, they don't see the issues as a priority, or they think they can solve the issue either on their own or through a litigated process.



In recent decades SAs have become an integral and expected part of alternative dispute resolution, particularly in the environmental field (Bean, Fisher, & Eng, 2007). Most publications on SAs are how-to guides written by practitioners (NOAA Coastal Services Center, 2007; Schenk, 2007; L. Susskind & Thomas-Larmer, 1999; Varvasovszky & Brugha, 2000). They often focus on how to conduct the most formal version of an assessment, which is often required when federal agencies act as conveners for collaborative processes. This approach almost always includes one-on-one confidential interviews with stakeholders and a written report that is shared with stakeholders, which includes recommendations for how to proceed. However, there are few if any examinations of how the outcomes of SAs, both in the information gathered and the relationships built, are able to impact the rest of the collaborative process.

In surveying and speaking with environmental mediators in Chapter 2, I look at how closely mediators' approaches match what is found in the literature and their view of how SAs impact the rest of their work in environmental mediation. My findings indicate there are key outcomes of SAs, such as: (1) mediators building relationships and gaining trust with stakeholders, (2) stakeholders understanding better their own interests, (3) stakeholders understanding better the interests of others in a situation, and (4) mediators advocating for collaboration. These outcomes can set the stage for the collaborative process that follows.

#### **1.4 Perceptions of Interdependence**

In recognizing their interdependence, stakeholders become willing to engage further in a collaborative process (Gray, 1989; Logsdon, 1991). They have to understand that the problem they want to solve cannot be addressed unilaterally and requires the concerted actions of multiple other parties. They also have to recognize any actions they take to address the problem will

impact the other players who have some stake in the problem as well. If those concepts are not recognized, the stakeholder has little incentive to collaborate with others.

Environmental disputes are notably complex and are characterized by coupled social-ecological systems and scientific uncertainty (J. Fisher, 2014). Often any change to the ecological system or the actions of the stakeholders in the social system can create change in the entire coupled social-ecological system. Interdependence in this context is the deep interconnection and the changes that reverberate within the entire system due to changes in one or more social or ecological processes. One example of social-ecological interdependence in Seabrook is the connection between the piping plovers and beach access. Piping plovers are an endangered species and prefer disturbed habitat on the margins of the dunes without much beachgrass on them. Their habitat is protected by the Endangered Species Act. When folks walk through the dunes, they make areas with sparse beachgrass, creating more of the disturbed habitat that the birds like. However, the plover protection restricts beach access to residents and visitors during nesting because human presence disturbs the birds and can result in chick death. The human social actions of legally protecting plovers and wanting to get to the beach, connect to the ecological issues of piping plover habitat, conditions allowing breeding success, and dunes not becoming overgrown.

Therefore, stakeholders must be cognizant of the interdependence of issues and their need to work with others in order to address their concerns. In Seabrook, the Town and the USFWS recognized that beach recreation and plover protection impacted one another, so they began to collaborate to address their interests in both issues. Many ADR professionals consider the recognition to be one of the pre-conditions necessary for a collaborative process to take place (Gray, 1989; Logsdon, 1991). The more the connections are understood by the stakeholders, the

more willing they are to collaborate on solutions (Innes & Booher, 2003).

In examining the important issues and stakeholders identified by participants from the Seabrook SA, I explore how interdependence is perceived, and how this perception is potentially impacted by participation in the SA. My findings indicate that though stakeholders tend to recognize the same set of general players involved throughout the process, some of the specifics of who they would like to work with are changed following the assessment. Their understanding of how issues are connected also seems to change somewhat, as the group of stakeholders begins to recognize a more similar set of issues to address. This research also demonstrates how well suited an interview process is for teasing out the details of perceived interdependence.

### **1.5 Outline**

What follows are three separate but related studies of SAs and perceptions of interdependence. Chapter 2 is an evaluation of how environmental mediators use SAs and what outcomes are possible from those assessments, including possibly fostering perceptions of interdependence among stakeholders. Chapter 3 is an SA I conducted with my advisor, Dr. Catherine Ashcraft, on dune and beach management issues in Seabrook, NH. In Chapter 4 I analyze the perceptions of interdependence among the stakeholders who participated in the SA described in Chapter 3, and how those perceptions changed through the process. I conclude in Chapter 5 with a short synthesis of my findings across all three studies.

## **Chapter 2**

### **Evaluation of Use of Stakeholder Assessments among Environmental Mediators**

Chapter 2 evaluates how stakeholder assessments are used in practice by environmental mediators. I review the literature on stakeholder assessments and see if the practice of stakeholder assessments matches what is recommended in the literature. I also address the gaps in the literature by researching the assessment outcomes that practitioners have experienced. The results from Chapter 2 were used to inform the methodology of the stakeholder assessment described in Chapter 3. My analysis in Chapter 4 builds off of questions raised by the results of Chapter 2.

#### **2.1 Significance**

Only in the past 20 years have SAs become an integral and expected part of ADR, particularly in the environmental field (ADR Interview 5, July 2016). The SA is generally prescribed as the first step in a collaborative process. As assessments became more prominent and accepted, they became required by federal agencies in collaborative or public participation processes, and the prescriptive approach, outlined in the literature review of this chapter, became more codified and rigid, when the original intent of the SA was as an iterative and flexible approach (Bean et al., 2007; ADR Interview 5, July 2016). These regimented and costly processes can seem prohibitive to practitioners and stakeholders alike, and the thought of conducting an SA might come across as wasteful or unnecessary.

Chapter 2 explores the current state of how SAs are practiced by environmental ADR practitioners and the reasons for and outcomes of this step in the collaborative process. The scope of this research focuses mainly on environmental mediation. Environmental disputes are

considered a subspecialty of ADR, with less than 10 percent of mediators practicing specifically in environmental conflicts (Raines, Kumar Pokhrel, & Poitras, 2013). The ecological systems in these disputes are characterized by varying scales of issues, sometimes making the dispute difficult to bound; the social systems are often a collection of various groups of stakeholders who engage with the ecological system in different ways. Any change to the ecological system or the actions of the stakeholders may create change in the entire coupled social-ecological system (J. Fisher, 2014), underscoring the inherent interdependence of system components.

Recognition of interdependence is considered an important pre-condition towards getting stakeholders to consider collaboration (Gray, 1989; Logsdon 1991). Recognition of interdependence, along with other conditions, such as interest in the situation, trust in the other stakeholder groups, and clear and transparent information, are considered essential to a collaboration being possible and succeeding. While there are myriad guides on how to properly conduct an SA and academic publications of what issues were learned from a particular SA, how SAs are conducted in practice, and the impacts of the assessment itself on the stakeholders and the rest of the mediation, are almost never critically examined.

This chapter reviews the literature on SAs to see why and how experts recommend they should be conducted, and what conditions are considered necessary for successful collaboration. I asked practitioners in the field of environmental mediation their reasons for using SAs. A select group of those practitioners were asked about what outcomes from the assessment they have seen that impacted the rest of a mediation and the stakeholders in those mediations. Results of the survey and interviews are analyzed to determine how the reasons and methods presented in the literature match with how environmental mediators conduct SAs in practice. The results from the selection of practitioners are analyzed to examine how the conditions for successful

collaboration are met through the SA, and if all conditions, particularly recognition of interdependence by stakeholders, can be met during the assessment.

## **2.2 Literature Review**

### ***2.2.1 Role of Stakeholder Assessment***

Stakeholder assessment (SA), also referred to in the dispute resolution literature as conflict assessment, stakeholder analysis or situation assessment, is commonly identified as a necessary first step in a collaborative process (Bean et al., 2007; Grimble & Wellard, 1997; Reed S. et al., 2009; Schenk, 2007; L. Susskind & Thomas-Larmer, 1999). The main purpose of this step is to determine if a collaborative process is likely to be successful, if stakeholders are willing to participate, and, if so, to determine who should be included, and what steps would need to be taken in order for a collaborative process to be successful (L. Susskind & Thomas-Larmer 1999). This includes identifying barriers to and opportunities for collaboration and identifying how the process needs to be designed in order to be successful (Sobel, 2000). Process design can include, but is not limited to, defining the goals of the process, setting the agenda, establishing mechanisms for selecting stakeholder representatives, timing and scheduling meetings, and setting the ground rules for the process (L.Susskind and Thomas-Larmer, 1999).

SA also includes sharing the gathered information and the mediator's recommendations with the stakeholders who would be involved in the collaborative process through some sort of value-neutral report (Schenk, 2007). SA can take many forms and use different tools depending on the context, but generally is made up of three components: (1) definition of a problem and its component issues, (2) identification of stakeholders, and (3) analysis of these components to

determine who should be a part of a collaborative process and what it should look like (Reed, 2008).

SAs improve the design of collaborative processes and increase the chances they will be successful. Without a SA, key players can be left out and the wrong issues can be emphasized (L.Susskind & Thomas-Larmer, 1999). A mediator designing a process might stereotype or group parties in a way the stakeholders disagree with or that alienates them from the process. Stakeholders may be represented by a party who does not accurately reflect their interests, or the mediator might assume a stakeholder holds a certain interest which they do not (NOAA Coastal Services Center, 2007). Perhaps most importantly, without a SA, a costly and time-intensive collaboration may move forward when it may not be the appropriate approach (Sobel, 2000).

The assessment, ostensibly a method for determining the potential success of collaboration, has been recognized to accomplish more, and is viewed as an educational opportunity for the mediator and the stakeholders involved in the process. During SA, the mediator can learn about the situation and stakeholder relationships (Bean et al., 2007). It is also an opportunity for the stakeholder to “assess the assessor”, and determine if the mediator is someone they trust to carry out a process (L. Susskind & Thomas-Larmer, 1999). Stakeholders can also learn about themselves by defining their interests and considering their Best Alternative to a Negotiated Agreement (BATNA) (Bean et al., 2007). The BATNA is how a party would proceed without a successful collaboration with other parties(R. Fisher et.al., 2011). In other words, it is their unilateral solution to the problem. For many parties, this is the first time they are exposed to learning about collaborative processes and a Mutual Gains Approach (L. Susskind & Thomas-Larmer, 1999). Conventional bargaining, based in positions not interests, is what

most people expect to engage in when attempting to resolve an issue with other parties( R. Fisher et al., 2011).The SA is an opportunity for them to learn about the alternative Mutual Gains Approach; they can learn about their BATNA and what their interests may be, as opposed to their positions.

### **2.2.2 Approaches to SA**

One of the most frequently referenced works on SA methods and approaches is Susskind & Thomas-Larmer (1999) in the *Conflict Resolution Handbook*. Susskind and Thomas-Larmer (1999) outline a prescriptive method as follows:

1. The assessor is given a mandate to do the assessment;
2. Stakeholders are identified and interviewed according to set interview protocol;
3. Interview findings are analyzed;
4. The feasibility of a collaborative process is determined;
5. A process is designed based on the feasibility and possible paths forward;
6. A summary report is shared with stakeholders

This is a framework frequently referred to by other practitioners and researchers using SA in environmental settings (NOAA Coastal Services Center, 2007; Sobel, 2000; Varvasovszky & Brugha, 2000). There are some commonly suggested techniques across different guides to SA; Table 2.1 breaks down these commonly suggested methods in the prescriptive approach. The table goes in order of the steps of the approach outlined above.



Table 2.1. Standard SA Functions and Methods and Alternative SA Functions and Methods.

<b>Function</b>	<b>Method</b>
Determine stakeholder groups and gather information	Web-based and document analysis
Determine stakeholder groups	Recommendations by stakeholders
Determine stakeholder groups	Recommendations from the convener
Help determine stakeholder groups and put conflict into larger context	Recommendations by experts who are not stakeholders
Gather information and gain trust	One on one Interviews
Allow stakeholders from the same group to brainstorm or to save time in being interviewed	Focus Groups
Assess in a geographically large system	Intensive surveys in lieu of in-person interviews
Fine tune information and maintain trust	Soliciting individual feedback on draft assessment
Fine tune information and begin idea-sharing	Soliciting feedback on draft assessment through a workshop or focus group
Create a general overview of the interests and issues in the conflict	Written synthesis of most frequently expressed themes and opinions
Visually represent interests, issues, and parties: can show stakeholder alignment and the issues on the table	Actor-linkage matrices or stakeholder-interest table
Enhance decision of who can be representative of other stakeholders in the collaborative process	Inclusion of network analyses
Show which parties know what information	Inclusion of Knowledge Mapping
Share the results of the assessment with those who participated so they can learn about the conflict as a whole	Summary report of the assessment shared with stakeholders and/or convener
Protect confidentiality in small systems or prevent contentious conflict resolutions from becoming incendiary	No written report

*Note.* Standard functions and methods are shown in white boxes and are adapted from the prescriptions given in L. Susskind & Thomas-Larmer (1999). Alternative functions and methods are shown in blue boxes.

Several authors have expanded or modified the prescribed framework. The examples of some of those alternatives are also presented in Table 2.1. Bean et al. (2007) critique the current state of SAs and lament what was supposed to be a flexible and nuanced approach to learning about a conflict, becoming a rigid set of steps that must be taken to complete the assessment as expected by the convener. They go on to explore how the standard framework can be and is changed by practitioners, pointing out that many practitioners do not always conduct interviews and sometimes do not even write a summary report. In several cases where the problem was on a large geographic scale, intensive surveys were substituted for in-person interviews (Gunton, Rutherford, & Dickinson, 2010; Maguire, Potts, & Fletcher, 2012; Weible, 2006). Other researchers have altered the framework to include more detailed analyses. Several researchers include network analysis to explore the relationships among stakeholders and to determine who can effectively represent groups (Kivits, 2011; Lienert, Schnetzer, & Ingold, 2013; Reed S. et al., 2009). Network analysis is a novel approach allowing for a view of stakeholder connections that might not come to the fore through traditional information gathering.

It should be noted there have been a couple of surveys in the literature of the methods used in conducting SAs. Reed S. et al. (2009) review the breadth of methods for identifying stakeholders, determining who the key stakeholders are, and analyzing the results of the collected data. Schenk (2007) reviews written conflict assessment reports of ADR practitioners and reports a 'state of the practice': the general approach of how most practitioners conduct the assessment (which largely follows the outline from Susskind & Thomas-Larmer, 1999), what methods are most often used, and what the best practices are. He reports most interviews take place in-person and are one-on-one, and most draft reports are shared with all interviewed stakeholders for comment before being shared with the convener or the public. While these

reviews explain the existing methods and common practices, they don't explore the impacts the assessment had on the stakeholders or the rest of the process.

### ***2.2.3 Creating Conditions for Successful Collaboration***

In order to get parties to come to the table, there must be enough interest from the parties and recognition of interdependence. Interdependence is defined here as the connectedness of stakeholder concerns and the need for multiple stakeholders' involvement to solve a singular problem (Gray, 1989). According to Logsdon (1991), the two most important components for multi-party collaboration is an understanding of the interests of the stakeholder party and how interdependent the party perceives themselves to be with other parties. The other conditions for collaboration can be achieved if these two conditions are met first. Stakeholders can come to collaboration two ways: through either the stakes being heightened and then perceiving higher interdependence, (for example, in Seabrook the USFWS was interested in protecting plovers and the town wanted to provide beach access, but only after new plover habitat on the beach made their interests conflict, did they recognize the need to manage access and plover habitat together) or perceiving higher interdependence and then the stakes being heightened (for example, the stakeholders sharing a reservoir may recognize their needs are interdependent, but only when the stakes are heightened by a drought will they become willing to collaborate).

Once these conditions have been met, some conditions should be built into the process to ensure success. A broad representation of stakeholders and their interests is agreed to be necessary for the process to be successful or considered collaborative (R. Fisher et al., 2011; Gunton et al., 2010; Steve Selin & Schuett, 2000). Successful collaboration often engages the stakeholders early in the process (Reed, 2008). Feelings of trust among those parties may not

exist at the beginning of the process, but must become part of the process for parties to be able to deliberate and implement their decisions (Fidelman et al., 2014; Waayers et al., 2012). Trust can be built through joint formulation of aims and objectives once deliberation has begun (Waayers et al., 2012). Complete and transparent information trusted by all parties is essential for groups to make good decisions (Karl, Susskind, & Wallace, 2007; NOAA Coastal Services Center, 2007). It is important to note collaboration is unlikely to succeed without the time and financial resources to carry on the process or an effective and experienced mediator to guide the process (Innes & Booher, 2003; Steve Selin & Schuett, 2000; L. Susskind & Thomas-Larmer, 1999).

Table 2.2. Conditions for a Successful Collaborative Process.

<b>Conditions</b>
Interest in dealing with the situation
Understanding stakeholder interests
Recognizing interdependence
Broad representation of stakeholders
Early engagement
Trust among the stakeholder groups
Complete and transparent information available
Available time and financial resources
Experienced and skilled mediator

## **2.3 Research Design and Methodology**

### ***2.3.1 Research Questions***

A review of the literature raises several questions:

- (1) Given the prescriptions in the literature to conduct SAs, how commonly do mediators actually do so when mediating environmental disputes?
- (2) When environmental mediators conduct SAs:
  - a. Why do they do so? What are their objectives?
  - b. How does their practice compare with the process prescribed in the literature?
- (3) What effect can SAs have on achieving the conditions for successful collaboration as described in the literature?

### ***2.3.2 Research Design***

A mixed-methods approach was used to address the research questions listed above. The target population for the study was environmental ADR practitioners who likely had experience with SA, in order to effectively address research questions (2) and (3). A list of environmental ADR practitioners was compiled based on dispute resolution literature, the US Institute of Environmental Conflict Resolution roster, listings from environmental ADR firms and personal communication. Those selected from the US Institute of Environmental Conflict Resolution roster were chosen if they specifically listed Conflict/Situation Assessment as one of their services provided and had a functioning email address listed. A survey was sent to this group of practitioners to address research questions (1) and (2). Interviewees were selected from the pool of survey respondents, based on willingness to be interviewed and their approach to SAs, based on survey responses. The interviewees were selected to represent a range in frequency of use of SA. Interviewees varied in the type of position they held, with roughly half working for larger

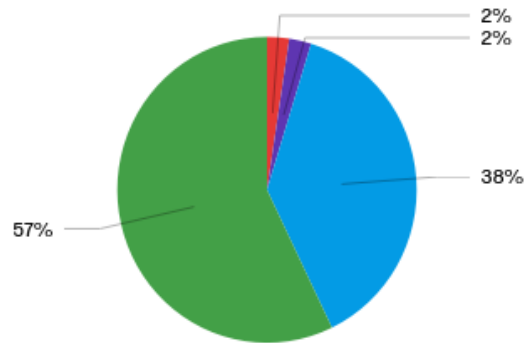
firms, and half working as more independent consultants. This group also split roughly between those who would be considered academics and had publications and those who worked exclusively as practitioners. They were also selected for a geographic breadth and to represent major firms in the environmental ADR field.

### **2.3.3 Survey Methods**

A survey was used to reach a wide audience of practitioners to address the research question, *How does the practice of environmental mediators compare with the process prescribed in the literature?* Survey protocol was tested on three ADR practitioners in June 2016, and the survey was modified based on their feedback. In the survey (see appendix B for survey protocol), practitioners were asked about their frequency of use of the methods outlined in Table 2.1 in order to determine how they conduct SAs, and if they deviate from the prescriptive approach. They were asked open-ended questions regarding their use of SA, how they define SA, and the value they place on SA. Questions about SA methods broke down each stage of the SA, asking about techniques in identifying stakeholders, gathering information, analyzing data, and reporting results. Practitioners were emailed to complete an open-ended survey in July and August 2016. Ninety-two were contacted and 42 responded.

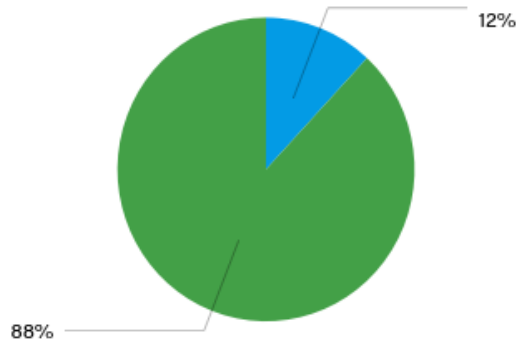
The survey sample included 40 practitioners who had mediated 11 or more environmental disputes with 24 of those having mediated 30 or more. Thirty-seven respondents had extensive experience with SAs and 36 used SA, as they defined it, more than half of the time in their work. See the breakdown in Figure 2.1.

In your career, how many environmental disputes have you mediated?



0 A few (roughly 1-10) Some (roughly 11-30) Many (roughly 30+)

Are you familiar with stakeholder assessments?



Not at all Yes, have had training but no experience Yes, have some experience Yes, have extensive experience

When you have mediated an environmental dispute, what percent of the time have you done a stakeholder assessment?

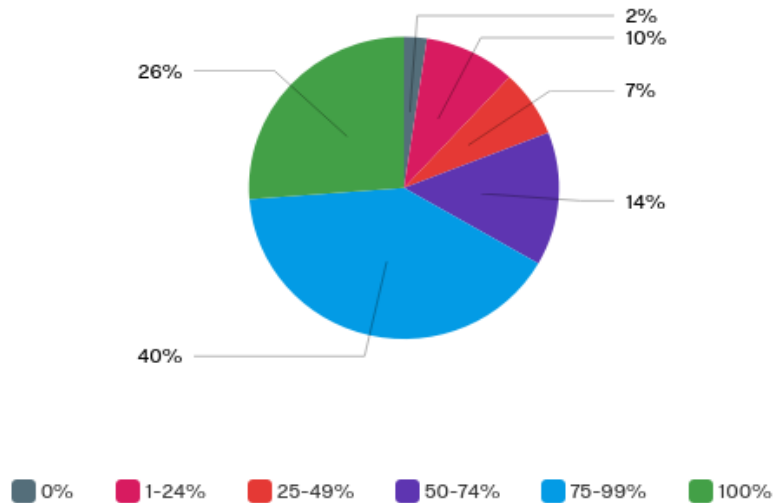


Figure 2.1. A Breakdown of Respondents’ Experience with Environmental Mediation and SAs in Three Graphs. From the top, they show practitioners’ experience mediating environmental disputes, familiarity with SAs, and frequency of use of SAs during environmental disputes.

### 2.3.4 Interview Methods

Ten practitioners were interviewed, representing a range of perspectives, in their geography, their employers, and their frequency of SA use (Figure 2.2). The interview protocol was tested with two ADR practitioners. The ten practitioners had varying responses to the role of SA in the survey and their time using SA, with some using it less than 25% of the time and others using it 100% of the time. All were experienced in environmental mediation, having mediated some (11-30) or many (30+) disputes. These semi-structured interviews more deeply explored their experience conducting SA, the outcomes they have seen from the process, and specifically if stakeholder perceptions of relationships or conflicts had changed, to address if they had ever witnessed a change in stakeholders recognizing their interdependence. Interviews



were conducted between July and October 2016. Interviews were conducted on the phone and audio-recorded, lasting from 30-120 minutes.

When you have mediated an environmental dispute, what percent of the time have you done a stakeholder assessment?

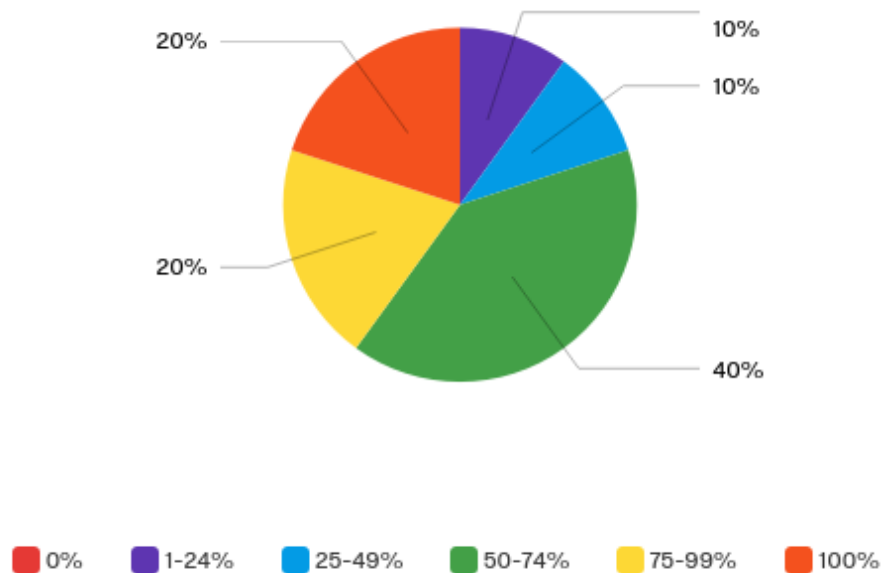


Figure 2.2. Frequency of use of SA among interviewed practitioners.

### 2.3.5 Analysis Methods

Survey data were analyzed to determine how most practitioners defined SA, their reasons for using it, and the reasons they might not use it. Responses from each open-ended question were aggregated, de-identified, and coded for emergent themes. Data regarding the use of different techniques were aggregated as well, with written-in techniques included also.

A codebook was developed based on the conditions for collaboration and the reasons for SA from the literature as well as emergent themes. The codebook was shared and developed with one other researcher for inter-coder reliability. Interview data were used to answer why practitioners use SA, what specific approaches they may use, and how the outcomes of the SA

impact the success of the collaboration. Interviews were transcribed and coded for themes in the codebook.

Survey and interview results regarding the reasons for SA and the techniques used were combined and compared to the reasons for SA outlined in the literature and the SA approaches outlined in the literature. Interview results regarding the outcomes of SA were evaluated for how they achieved the conditions of successful collaboration.

## 2.4 Data and Findings

### 2.4.1 Role of SA

#### *SA Definition*

Table 2.3. Surveyed Practitioners' Definitions of SA Classified by Method, Function, Timing, and Role of Assessor.

Method	Function	Timing/Sequence	Role of Assessor
Interviews (11)	Identifying stakeholders (6)	Before design, before engagement, before intervening (3)	Third party (4)
Variety of tools and approach (6)	Identifying interests (26)		Neutral (8)
	Informs process design (12)		Independent (3)
	Determines if a process should happen/ agreement is possible (11)		
	Mediator understand the situation (10)		

Table 2.3 breaks down the different definitions given by practitioners in the survey by how they decided to define SA. Most practitioners define SA by its function, mostly discussing

its use in identifying parties' interests, informing the process design, and determining if the process should go forward. They also define SA by the methods used, namely interviews, with some emphasizing the toolbox approach to SA, indicating one size does not fit all. Many single out the role of the assessor in the SA, highlighting the assessor as third party, independent, or neutral. A small number define SA by the timing of when the SA process occurs, as specifically before engagement or intervention.

One note on SA that came up with a couple of interviewee practitioners was the role of the assessment later on in the process (ADR interview 8, August 2016; ADR interview 10, July 2016). They each spoke about the importance of a mid-process assessment, both in planning for it, and the added benefits it could contribute to the process. While they each began most of their processes with some sort of SA, a series of private meetings or phone calls with process participants at a significant transition or stalemate in the process was a step they each considered very important in order to move forward. So while the common understanding of SA, in both the literature and among practitioners, is as a beginning step, it is also important to consider the role of a secondary SA as it functions at later points in mediation.

### *Reasons for and Limits to SA*

Most surveyed practitioners identified at least three reasons for conducting an SA (Table 2.4). The most common reasons were explicitly about answering questions about the logistics of the process, including how it would be designed, what the issues of the conflict were, who would participate, and whether or not the process would happen. The less common reasons focused on stakeholders and how they might be involved with the process or with the mediator and getting common information for all involved.

The interviewees corroborated these results, with all of them mentioning process design and learning the issues as main reasons for assessment. Most mentioned learning about party relationship dynamics and building some relationship with participants. Several also discussed framing the issues in a way acceptable to all parties, and learning about the range of issues so there could be more integrative potential.

Table 2.4. Reasons to Conduct an SA According to Surveyed Practitioners.

<b>Why use a SA</b>	<b>Tally</b>
Inform process design	19
Define issues and interests	14
Whether a process should proceed	12
Determine who should participate	11
Determine relationship dynamics	5
Foster mutual understanding	5
Build relationship between stakeholders and mediator	4
Get buy-in from stakeholders	4
Develop shared baseline information	4
Potential options for resolution	4
The higher the level of conflict the more important the assessment	4
Determine willingness to participate	3
Determine capacity to participate	3
Teach about Mutual Gains Approach	3
Client put it in scope of work	1

Table 2.5. Reasons to not Conduct an SA According to Surveyed Practitioners.

<b>Why not use a SA</b>	<b>Tally</b>
Budget	19
Time	13
N/A always use it	10
Existing information is sufficient	7
Late entry/ assessment already completed	7
Client didn't want it	4
Convener doesn't understand the importance of the assessment	4
Small scope	3
Parties won't participate	2

A substantial number of the practitioners surveyed did not have any reason why they would not complete an SA, indicating they always use it in a collaborative process or mediation (Table 2.5). The common reasons for not conducting an SA were time and budget. The client or convener was also a reason for an SA to not occur, either by not including it in the budget, or not understanding the importance of it. Others indicated sometimes it was not worth their time, because the information they could get from an SA was already available, possibly because someone else already completed one, or it was a small scope with a small number of parties.

The interviewees echoed the major constraints of time and finances raised by survey respondents, however many discussed negotiating with the client to do some sort of limited or less formal assessment so they would not have to go into a mediation uninformed. This included calling or meeting with only some of the parties, or doing a quick one-day assessment where a team of assessors goes out and talks to all parties for a short time (ADR interview 5, July 2016; ADR interview 7, July 2016). A full-blown formal assessment with a final written report and presentation to the stakeholders was agreed to be limited to high levels of conflict or significant monetary outcomes. It was noted by one interviewee that if there had been some past work with

groups or he was familiar for some reason, it would not add much value to do an SA (ADR interview 6, August 2016).

#### **2.4.2 Approaches to SA**

##### *Identifying Stakeholders*

The most common approaches in the survey results for identifying stakeholders were recommendations from conveners and other stakeholders (Figure 2.3). Sometimes practitioners consulted documents, web searches, and experts in their own network or familiar with the situation. Some of the other methods identified were consulting media reports, public records, and prior professional knowledge.

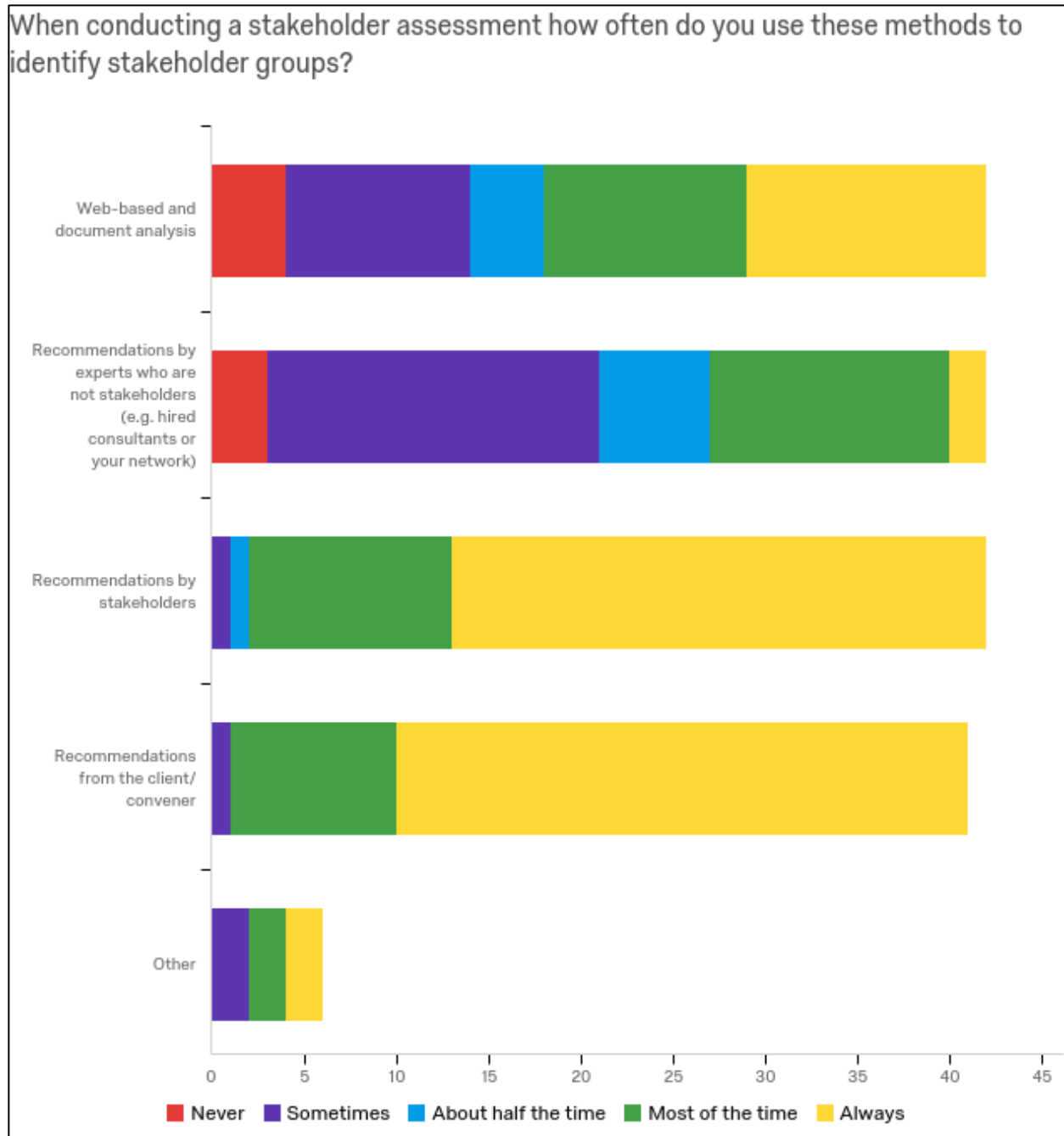


Figure 2.3. Methods used by surveyed practitioners to identify stakeholders during a SA. Colors indicate frequency of use of each method.

### *Gathering Information*

The most common approach among those surveyed to gather information was the use of one-on-one interviews, with individually solicited feedback on draft assessments also being a

commonly used approach (Figure 2.4). The less common approaches are still used by many practitioners at least some of time, indicating surveys, focus groups, and workshop feedback sessions, are all possible methods of gathering information, depending on the situation at hand. Other methods written in included review of documents submitted by the parties, tours or field trips with the stakeholders, meetings of interest-based caucuses, and small group interviews of two to three people.



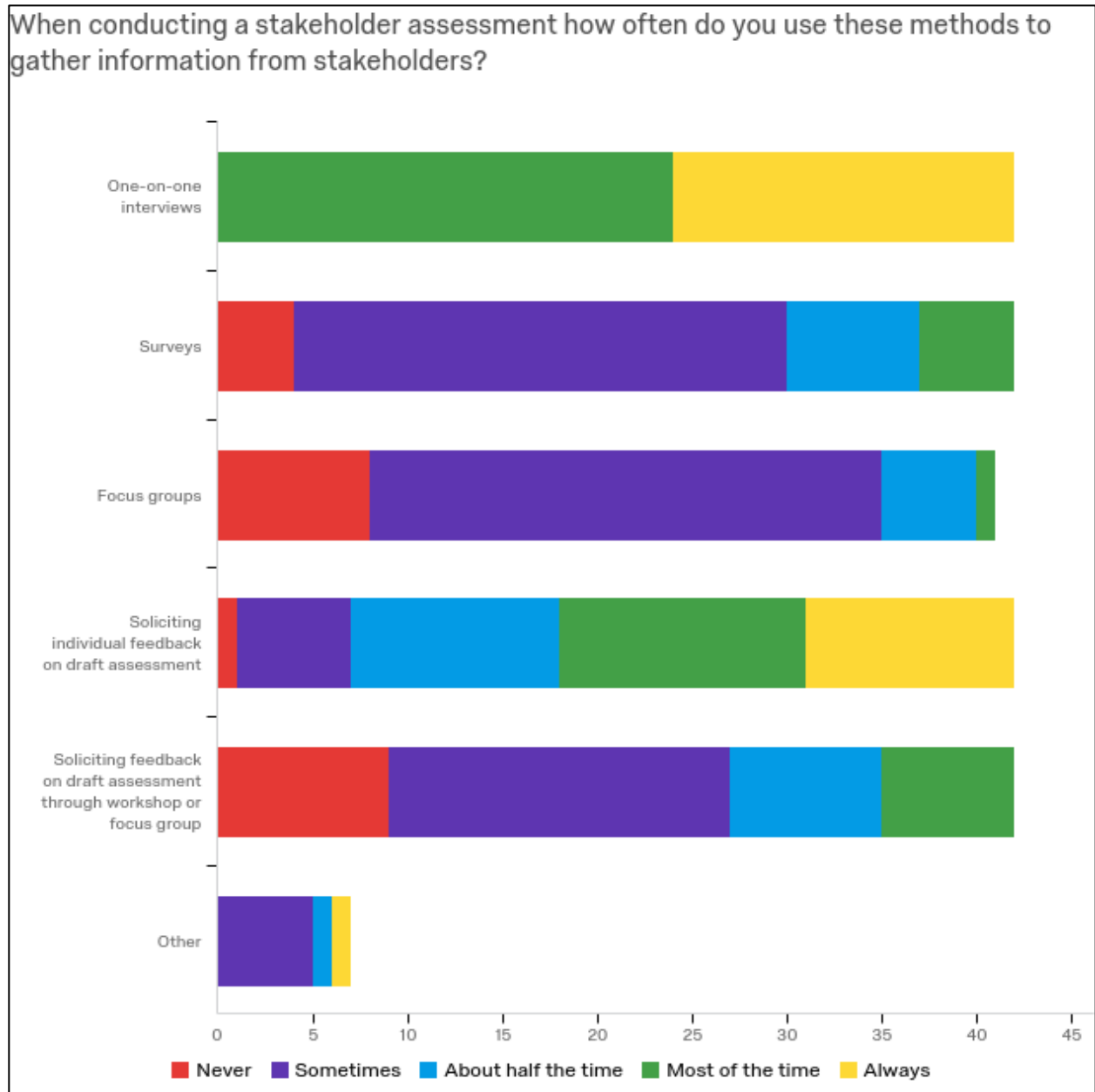


Figure 2.4. Methods used by surveyed practitioners to gather information from stakeholders during a SA. Colors indicate frequency of use of each method.

In the interviews, practitioners discussed the difference between in-person and phone interviews. They emphasized the interview, particularly an in-person interview, as a time to gather tangible and intangible information, using flexible and open-ended questions to get parties to challenge their own assumptions. In particularly contentious situations an in-person interview

was viewed as extremely important. However, practitioners reported using phone interviews often because they are less costly, or they have limited time in being able to meet all parties (ADR interview 5, July 2016; ADR interview 8, August 2016). They still want to interview stakeholders to obtain valuable information and make connections, but they do not have the ability to do so in-person with all parties.

### *Analyzing Data*

The most common approach to analyzing data was a simple tally and synthesis of frequently expressed themes (Figure 2.5). Stakeholder-interest tables are also an approach practitioners seem familiar with, but are not as frequently used as the simplest method. Fewer people employed the more complex analytical approaches, only sometimes choosing to employ techniques like knowledge mapping and network analysis. Other methods of analysis practitioners wrote in included narrative description, formal content analysis, and mind mapping.

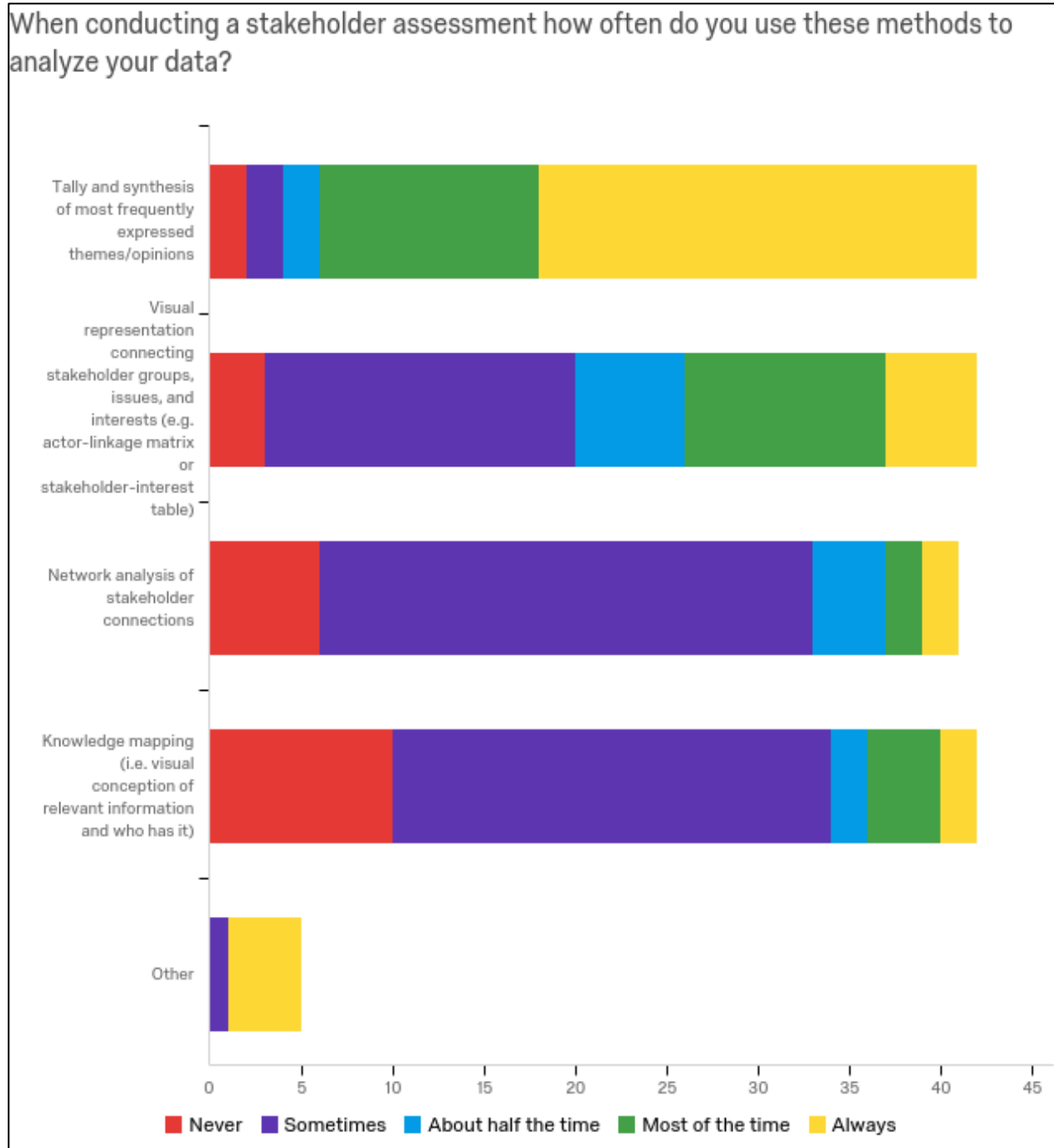


Figure 2.5. Methods used by surveyed practitioners to analyze collected during a SA. Colors indicate frequency of use of each method.

In speaking with interviewees, it became clear that many practitioners were not using scientifically rigorous forms of analysis. Instead, their emphasis was on capturing impressions of

people and of issues and using those impressions to develop frames and narratives over the course of the SA in order to inform the subsequent process design.

### *Communicating Results*

Practitioners used a variety of methods to communicate SA results to stakeholders, for example by sharing a final report. Very few always used one of the approaches listed (Figure 2.6). The most common approaches were oral presentations to the convener, oral presentations to stakeholders, and a written report shared publicly. The approach advocated for by the literature, a written report to stakeholders and convener, was not as commonly used. All of the approaches were used ‘sometimes’ to ‘most of the time’ by practitioners, indicating different situations require different approaches. It also leaves room for the possibility of situations where no report is given.

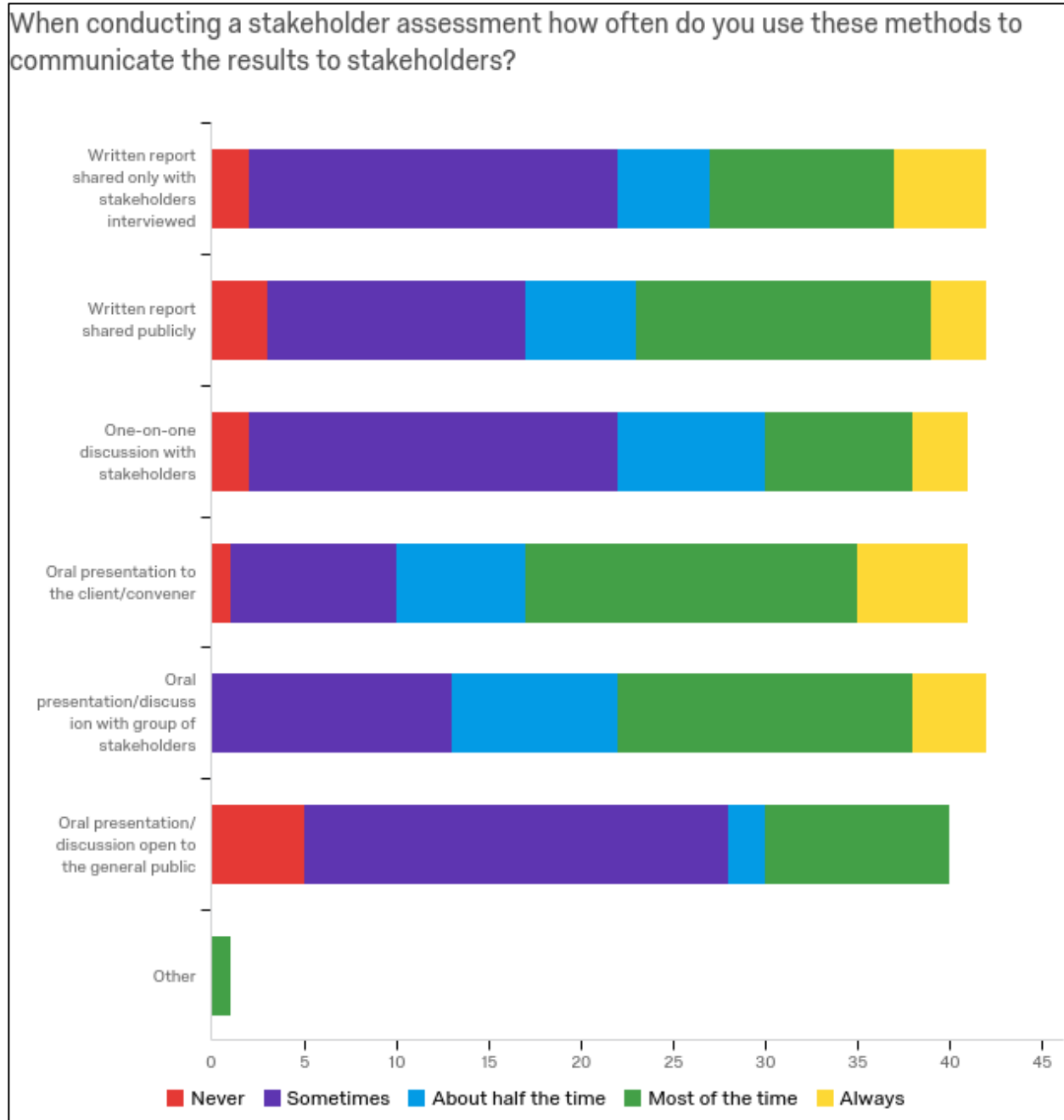


Figure 2.6. Methods used by surveyed practitioners to communicate results during a SA. Colors indicate frequency of use of each method.

In the interviews, there was a lot of discussion about the value of a written report and when it is most appropriate or useful. When the mediator’s main goal is to educate his or herself

about the situation and he or she employs a less formal assessment process, practitioners said there is little opportunity or need to communicate the results. In situations where trust in the process or the convener is low, sharing a written report with all parties or with the public can help give credibility to the convener and the process.

### ***2.4.3 Creating Conditions for Successful Collaboration***

The outcomes of SA lead into the rest of the collaborative process. Ideally, those conditions for a successful collaboration (Table 2.2) exist or can be brought about by using a SA. Reported outcomes of SA discussed in this section come from interviews with practitioners. They roughly break down into outcomes useful for the mediator, outcomes impacting the stakeholders, and outcomes affecting the process itself. A number of the interviewees also discussed the limits of what could be achieved from an SA alone. Below, I first describe successful outcomes and then discuss these limitations.

#### *Outcomes for Mediator*

##### **Building Relationships**

One interesting finding, which emerged more clearly from the interviews in comparison to the survey results, is the importance of the SA in building rapport and trust with the stakeholders. The interviews are a way for the mediator to get to know the parties before a process moves forward and for the stakeholders to begin to get to know the mediator as someone they can trust throughout the process. Six of the practitioners interviewed highlighted building relationships, with several describing how they made sure they were able to at least do some sort of bare bones assessment or limited number of interviews on little to no budget because they

needed to have some relationship built with the parties before everyone came to the table. These relationships are built on the confidentiality of the interview conversations. The stakeholder is able to be honest and forthcoming, and in doing so, can test out the assessor, and see if they are able to trust the assessor later on as the mediator. It's important to note this is particularly true for in-person interviews.

The mediator is also able to establish his or her self as the right person for any subsequent mediation. Mediators have different styles and approach a situation and design a process differently. Stakeholders may be skeptical or not sure if the mediator is capable of addressing a situation and all the other players. One practitioner explained how she gets a stakeholder to begin to trust her and her approach. When a stakeholder expresses distaste for an opposing parties' presence in mediation, for example, their tendency to steamroll others in meetings, it is an opening for the practitioner to share some of her methods for dealing with that particular tendency. If the stakeholder thinks that approach would be ineffective in addressing the problem they have identified, other approaches are offered that the stakeholder may find more appropriate for dealing with that presence in the mediation (ADR Interview 5, July 2016). Strategizing with the stakeholder during their interview reinforces the mediator's credibility as an experienced and skilled mediator. The transparency of this exchange also builds trust between the stakeholder and mediator and their confidence they can work together to have an effective process.

### Establishing Independence and Neutrality

Beyond establishing their credibility as a skilled and trustworthy mediator, the SA can also provide a setting for the mediator to establish their neutrality and independence from the client. Five practitioners discussed the need to establish one's neutrality. It's important to

establish the process is not biased toward the party paying for the mediation. This is particularly true in situations where stakeholders may begin with a significant amount of distrust for the convener of the process. Establishing the mediator's independence and neutrality can take place either during the interview process or as a result of the written assessment. During the interview process, the mediator can build rapport with the stakeholders, particularly with groups feeling left out or maligned by the convener. The mediator can also use the written assessment to emphasize their neutrality, both in how the report is written and in its release.

For example, one mediator interviewed discussed the SA he completed for a private company about a potential mine. The stakeholders in this work were extremely skeptical of the company, and were now skeptical the mediator had been bought by the company to produce a biased assessment. The mediator explained that the environmentalist and local groups were not willing to even talk to him, and considered his and his ADR firm's reputation to be in question. He had been clear with the client he had to be neutral and impartial in his assessment, and expressed as much to the environmentalists and local groups, who still would not engage in the assessment. He explains the situation in his own words:

...Initially most of the environmental and sport and commercial fishing communities wouldn't talk to us, and many of the Alaska native communities wouldn't talk to us. Because they felt that if Pebble is paying for the assessment, they are controlling what they want to get out of it. Environmentalists would say to us, 'Why are you doing this? Keystone has a great reputation for doing neutral impartial work, so why would you even consider working with a mining company that wants to destroy the Bristol Bay watershed?' And we said, 'We told them we are neutral, independent and impartial and that's how we operate. We work for all stakeholders no matter who is paying for our services. We told them we weren't there to help them get a mine but we would conduct an independent assessment to identify peoples' concerns and to see if there was any interest in a dialogue of some sort to talk about those concerns.

They still wouldn't talk to us. So we went ahead with the assessment. And then they read it and it was really pretty brutal. It was very honest with what people were concerned about, and they didn't think it would be that honest. Part of our



understanding with Pebble was we were going to release the draft assessment to the public at the same time we released it to them, because we wanted to assure people that the company hadn't edited out unfavorable information before it was released. Once we released the preliminary assessment report, we started going back to the communities to talk about the report and to gather additional information. At that point, most of the groups that had refused to talk to us before were eager to talk to us now. Although they were still very skeptical, they couldn't believe we were that honest and that Pebble actually allowed the process to move forward without trying to influence it. (Interview, Todd Bryan)

The mediator was able to re-establish his credibility in his role as an assessor and establish the work following the assessment as credible. He did this by being clear about the client's role in the situation and making sure the written report was public. His group also released the report to the public and the client at the same time, so it would not appear to have been censored in some way by the client. The mediator was able to establish credibility not only by how he engaged with the stakeholders but also in how the assessment report was written and released. How a mediator conducts oneself outside of the interview process of the SA can also be an opportunity to build trust with stakeholders, as demonstrated here by how the content and approach of the written assessment was the key to engaging resistant stakeholders.

### *Outcomes for Stakeholders*

#### Defining Interests and BATNAs

One generally recognized purpose of the SA is in defining interests and BATNAs. Parties often do not know the specifics of what they would like from a collaborative process because they have not asked themselves those questions. They have not considered what they might be willing to accept, and the SA is an opportunity for the assessor to push them to figure this out. Nine of ten practitioners talked about getting these specifics out of their interviews. One practitioner talked about how he pushes people towards defining these points. He engages a

stakeholder in a frank conversation about worst-case scenarios, when they are considering fighting a collaborative process instead of participating. They are sure they will not lose, but he pushes them further to what it would mean if they would lose, and if they are willing to risk that loss instead of engaging in a negotiated process (ADR Interview 2, October 2016). The practitioner pushing and prodding exposes the BATNA of the stakeholder and in doing so gets them to consider engaging in the negotiated process when they were less willing to do so earlier in the interview. Probing deeper during interviews is a recurring approach for mediators to learn about underlying interests and to get stakeholders to consider different scenarios and perspectives. This technique and the outcomes that can come from probing are reiterated in sections below, particularly Reality Checks and Venting, The Perspective of Other Parties, and Broadening Scope.

### Reality Checks and Venting

The SA is an excellent opportunity for the stakeholders to get a reality check in their situation. All practitioners talked about using the SA to challenge stakeholder assumptions in some fashion, and five practitioners talked about using the SA explicitly as a way to bring expectations in line with the reality of the situation. Parties might think their ideal outcome is possible, when it really isn't, or that the other parties have no good reason for holding the positions they hold.

As opposed to using the SA process to let a party realize some of their interests might be unrealistic or blown out of proportion, the assessor can also use the process to show parties that some of their interests aren't unrealistic or unpopular at all. One practitioner described how several parties privately thought they were alone in wanting a larger agency to cede leadership of

a process. They each thought the larger agency would not want to engage in the same sort of process, and it would be better for a smaller agency to take the lead. It turned out the larger agency also agreed the smaller agency would be better suited for leadership of a process. The practitioner insisted the confidentiality and openness of the interviews were the only reason the process could be designed in a way all of the parties favored (ADR Interview 8, July 2016). If the parties had come to the table first, without private interviews, the wrong agency would be in the lead and no one would be happy about it. All of the parties were able to engage in a process where they were not only confident in the mediator, but also confident in the party taking the lead.

One practitioner noted a reality check could also come from stakeholders finally having the opportunity to be heard in these confidential interviews. Once there is the opportunity to sit down and talk out the issues in private, there is the possibility a stakeholder can see the situation more objectively, because he or she has been heard and his or her emotions can subside. One practitioner explains the anger people can hold prior to being engaged in the assessment process and how the assessment can lead to cooler heads prevailing:

Well the assessment process is a venting experience for people and ... they carry so much anger based on their perception of not being included or honored or respected or having any influence - and whether perceptions are real or imagined, they are real to them, so they come in with a whole scenario and narrative in their head. So as they talk through it, I can pose questions about different concerns going through the narrative. Because the first question is always how did you get here? And I listen to their narrative, and then begin to ask them to take it apart ... so its kind of a pressure valve release..... Because no one has actually sat down and done nothing but listened to them. They have expressed themselves nearly all of the time in public meetings in a very defensive way, a competing way. .... So often they will start out very angry or frustrated, or exhausted and weary, and by the end, often times we are laughing, ... because by the time you get to the end you are asking them if they can commit to collaboration, if they would be willing to come in good faith to try to work things out? These are people who can't breathe the same air in the same room and in the end they've agreed to try it. And

that's also because of the whole experience of having someone listen to you.  
(Interview, Sue Senecah)

She further explained that through the process of venting, stakeholders consider their own expectations and the possible outcomes of the situation. Venting can get stakeholders to begin to consider how realistic those expectations or possibilities are. According to this mediator, engaging someone in a thoughtful manner, where they get to tell their story and have someone examine with them their understanding of their own interests and events, is transformative. In the moment the stakeholder is willing to engage further because their version of the story has been told, and they can become open to considering their own interests from an objective perspective (Interview, Sue Senecah).

These reality checks can happen both in the interview process and later from the report. In the interview process, especially once the mediator is familiar with the perspectives and the issues, the mediator can use the interview to expose the stakeholder to other points of view. The written report can also put a party's interests into the broader context of the situation, and they can see how their interests fit in with the interests of the other parties.

### The Perspective of Other Parties

ADR practitioners provided examples of stakeholder assessments through which, participants changed how they viewed other parties' interests and the need to work with others on integrative solutions. As the mediator becomes more familiar with the situation, they can use the interview as an opportunity to share other perspectives, and talk to the stakeholder about where the other parties may be coming from. Six practitioners spoke about the SA being an opportunity for parties to begin to hear and understand the "opposing" points of view. This often goes hand in hand with the reality check mentioned above. The mediator can prod the

stakeholder to consider the conflict from others' perspectives, and have the stakeholder report how they understand the interests of the other parties. The mediator can ask the stakeholder to put themselves in the other parties' shoes and consider the interests of the other parties. When the process begins, there can be some understanding that the positions of the other parties are not as rigid as the stakeholder originally understood it and each party has underlying interests that brought them to their position (ADR Interview 1, October, 2016).

The assessment can also potentially broaden the stakeholder's view of what the stakes are in a conflict as well as get them thinking about some creative alternatives or integrative solutions. If stakeholders are considering integrative solutions, they have already internally accepted that they are interdependent. One practitioner explained how she got stakeholders to consider other perspectives and start to develop solutions. In talking to locals who were upset about logging, she was able to help them to consider some integrative solutions, by explaining to them logging profits supported local education. Through being asked what could replace the educational funding, the locals were able to appreciate the complexity of their situation and begin to consider some scenarios that might be appealing to the other parties. Testing creative solutions in the confidential space of an interview can be more comfortable for stakeholders than doing so in a public setting (ADR interview 1, October 2016). Stakeholders, in testing solutions incorporating other interests, can begin to incorporate other perspectives into their understanding of the situation, and internally accept their need to work together.

The final written report in particular may also help individual stakeholders or the convener understand the perspectives of others. By putting people's interests and concerns in one document without attribution or accusations, parties can sometimes come to see the legitimacy of others' concerns. One practitioner explained how a federal agency convener, who had biases

against the concerns of some stakeholders, was able to finally understand that the stakeholders of the community had legitimate concerns. He had always borne the brunt of complaints from the community, so when it was presented in a report, from a neutral perspective and without a complaining tone, he was able to begin to take seriously their issues and decide to be proactive in helping them solve their problems (ADR interview 4, October 2016). The neutral viewpoint gave legitimacy to previous complaints. Considering other perspectives can be important in establishing a basis from which to come together to collaborate.

### *Outcomes for Process*

#### Capacity Building and Coaching

The SA is a stage for the mediator to influence the process to come. One piece of that can be in identifying the need to build capacity for certain stakeholders to participate. Small communities or neighborhoods often do not have a clear representative the way agencies or companies do. The SA is an opportunity for the mediator to work with these groups to get ready to be an effective part of the process. Four practitioners discussed this outcome, with one expanding on the process she took to engage a community at a superfund site and help them develop strategies and choose representation for taking part in a mediated process.

I did a mediation on a superfund site and this whole neighborhood was going to be leveled -they were across a small river from the plant and they weren't going to be able to clean up. ... We met with all of the residents ahead of time because we can't have all of [them] ... negotiating a settlement at a table with this company. It just wouldn't work. So we went over parameters, we went over boundaries; we went over the issues that needed to be brought up that they wanted to be considered. So we kind of did a quasi-mediation without the other party there and then we asked them to choose two people that would represent them and would have the authority to make decisions on behalf of everyone. And at the meetings those two people sat at the table with the industry folks but all of the others could sit in chairs in the room to observe. So they were kind of in on it and there were a few times when they stood up and complained, and they were a little

bit out of order, but in the end it worked out really well. So we did individual assessments but we also brought everyone together and reviewed the assessments and went over everything that was brought up and their sense of what their thresholds were and what they wanted. (ADR interview 1, October 2016)

In this case the assessment was an opportunity to meet individually with families affected by the contamination but also to work with the community to make sure there was some agreement on what outcomes they wanted. It was also an opportunity for those who were selected to represent the community to learn how to advocate for the most important issues during the negotiation. This sort of capacity building work is a clear example of the subtler coaching which can take place during interviews. Four practitioners talked about the SA as being a time to prepare stakeholders for negotiation, with some teaching about the Mutual Gains Approach, but others mainly focusing on the pieces discussed earlier, like defining interests and BATNAs, developing alternatives, and considering other perspectives.

### Broadening Scope

One other key aspect of using a Mutual Gains Approach is broadening the scope of a conflict so there is more integrative potential. Five practitioners discussed broadening the scope in the SA as a way of giving the process more potential success because more issues could be considered at the table. One practitioner discussed how she had been working on a contentious conflict among environmentalists and the air tour industry at the Grand Canyon over noise pollution in the canyon. Though the process did not end in consensus, broadening the scope helped give these parties more to talk about at the table, and gave agencies a basis for the recommendations they adopted on their own after technical information prevented consensus from being reached.

...So the assessment showed that it depends where the air tours are flying, at what times of the day, some people said if you could just not do it at sunrise and sunset,

give us a little peace and quiet and start an hour after sunrise and an hour before sunset, that would be very helpful. Those kinds of things came out in the assessment and enriched what there was to talk about at the table, which was very helpful. Otherwise they were so set on hating each other over that single polarizing issue [aircraft noise from air tours] that it would have been hard for them to even—I would have tried without an assessment, to tease out those issues, but it would have been harder. It was good to be able to talk to each of them individually, and have them kind of stretch their brains in an environment with just me. (Interview, Lucy Moore)

There were other factors during the mediation influencing the outcome of the process, particularly the finding that the decibel level of the Grand Canyon was coming from out of sight commercial flights overhead and not from the air tours. So the recommendations the agency adopted in the end were rooted in the assessment report and the other issues related to the air tours besides the amount of noise they made. They were able to do so because the assessment broadened the scope beyond the single contentious issue of noise from air tours so there were more options to consider in arriving at a better set of recommendations.

It was also not uncommon for practitioners to talk about how broadening the scope in the SA could raise issues not initially on the table, and in turn, pivot the process to be about those other issues. Three practitioners discussed how the wrong issues might be on the table in the first place. One practitioner explained how broadening the scope changed one project entirely, from a report on an aluminum smelter proposal, to an assessment of how industrial siting and environmental review occur in one country.

The opportunity was to give advice about essentially a written document. What we said was “we don’t know enough yet to write our report, so we need to go to [country] and we need to talk to people.” And in the process of talking to people what we tried to do was essentially enlist in the concept of a much more collaborative planning process and a much more robust environmental review process that existed for anything in [country]. And so in a sense the aluminum smelter proposal was a carrier beam for innovation and environmental policy in a nation. We began by playing it straight, and we wrote out a list of questions and we started interviewing people. But I will be honest with you as the interviews morphed, really what we were doing was exploring the ways of having a civil



discourse or a conversation with civil society about industrial siting in [country]. So the scope of the project widened dramatically. Interestingly the aluminum smelter project, which had been on a really serious fast track, and was sponsored by a major multi-national corporation, with very high-level support from central government, was withdrawn some months after we did our work. Now was our work the cause of this? I don't know but it might have been. (ADR Interview 7, July 2016)

Here the mediator not only worked with stakeholders to broaden the scope, he changed the conversation completely. This practitioner played an extremely active role to affect the outcome of this assessment and essentially change how a country's government considered environmental review. He changed the scope of the project through engaging stakeholders in open-ended conversations, but also by advocating for a collaborative approach to environmental policy in this country.

#### Advocating for Collaboration or Ripening the Situation

Sometimes the mediator can play a particularly active role in bringing the process about in the first place. Not everyone saw advocating for collaboration as their role, but three spoke about it specifically. The SA was not just an opportunity to learn about the situation and share that knowledge with the parties, but to convince the parties, on the conveners behalf or not, that collaboration would be the best approach to addressing a situation. One practitioner gave an example of a state regulatory agency that wanted to engage a community to come to negotiate with a mill that would be out of compliance. The agency wanted the community to be at the table to have a say in how the mill impacted their air quality. The practitioner had to use the assessment to convince community members it would be worth their time and effort to engage in the process (ADR interview 4, October 2016). In this case, the practitioner had a mandate from a convener to bring about a collaborative process, because the agency thought it would lead to the best outcome.

Others worked without a convener but with grant funding, or with potential funding in mind. One practitioner explained conducting an assessment on water resources and development in a Western state for the purpose of starting a collaborative dialogue. No one asked them to do it, but they had noticed how property was developed with little to no regard for where the water for a development would come from. So they did an assessment, and reached out to developers, water resource engineers, and environmentalists, who happened to all be interested in coming together to discuss this issue. This interest and the final assessment report allowed the practitioner to apply for grant funding to convene the collaborative dialogue (ADR Interview 2, October 2016).

Not all practitioners said they see advocacy as part of their role. Issues too far upstream, i.e. they were down the road and few parties were upset or in conflict yet, were not worth some practitioners' time. They either weren't hired or didn't involve themselves in situations where they would need to advocate for a process. Certain firms had a reputation for doing work focusing on upstream conflicts because they had the ability to secure resources to do so.

### *Limits of the SA*

The outcomes explained above are the possibilities of how the SA can influence a collaborative process. However, particularly because of its part in the process as a stage before stakeholders meet, the SA may not have an impact on all aspects of the process to follow. Practitioners were asked specifically if the SA could change how stakeholders viewed a conflict or viewed their relationships with other parties. This question was asked to address changes in perception of interdependence. Obviously, some pieces of how a conflict is viewed and how relationships are viewed were addressed as outcomes from the SA. However, most of those

interviewed insisted their examples of change were only sometimes possible. Others were not particularly convinced the dynamics of a conflict could actually change before the parties engage with one another face-to-face. It is important to note, many practitioners asked about these changes said they had never specifically asked participants how the SA might have impacted them. I analyze this in Chapter 4.

Two practitioners pointed out they do not see the main purpose of the written report as giving stakeholders a view of the greater context of a situation. Instead, it is an opportunity for stakeholders to ensure their views are included and their friends had been consulted as well. Stakeholders want to know their perspective is represented and their voices are heard, and the other parts of the report are secondary. “If in the assessment they see their friends and they see their interests and their needs, then they think I have a handle on what’s going on. I don’t think they look at it and say, ‘Look she got my needs, and their needs, and their needs’- we’re selfish people we don’t really care about other peoples’ needs.” (ADR Interview 9, July 2016). These same two practitioners insisted the SA, and the written report in particular, often reinforce the opinions of the stakeholders. “They’re probably not going to reevaluate how they feel about somebody. In fact it’s probably going to be reinforced. *Ha!* I certainly know who said *that*. You didn’t have to use any names for that one, that sounds just like so and so.” (Interview, Lucy Moore).

The interviewees were resistant to the idea that the SA might affect the relationships between stakeholders. Five practitioners were vocally skeptical that any change in relationships could happen before parties convened for collaboration face-to-face. One practitioner also said he did not view changing stakeholders’ perceptions of one another as necessary for a successful collaborative process (ADR Interview 4, October 2016). While there was some acceptance that

minds may be opened during the interview process, or from reading the report, most interviewees considered this to be “too light a touch” or “a blip on the radar” (ADR Interview 4, October 2016; ADR Interview 9, July 2016). The SA was not considered significant enough of an intervention to change how relationships were viewed. Every practitioner who voiced this skepticism said the work of changing relationships and breaking down barriers could only begin to happen once all of the groups sat down together and opened a dialogue. There were three interviewees whom felt SAs had the potential to change how parties viewed one another. It was either something they tried to impact during the assessments they conducted, or it was a suspicion of theirs that change in relationships was possible because of the assessment. However, practitioners who had a comment on the potential of changing relationships during the assessment also mentioned they had never asked the parties they worked with about how their perceptions may have changed.

## **2.5 Discussion**

### ***2.5.1 Role of SA***

There was strong agreement between the reasons to do an SA as described in the literature and as shared by practitioners in the surveys and interviews. The top five reasons practitioners gave were also prominent in the literature: informing process design, defining issues and interests, determining if a process should proceed, who should participate, and determining relationship dynamics (Bean et al., 2007; NOAA Coastal Services Center, 2007; Sobel, 2000; L. Susskind & Thomas-Larmer, 1999)(Table 2.6). Most of the other reasons also had some reflection in the literature. This indicates practitioners are both familiar with the body

of the literature and the theory behind their work, and the literature reflects accurately the general consensus of environmental ADR practitioners, and not just those who are scholars.

Table 2.6. A comparison of the reasons to use an SA according to ADR practitioners and the ADR literature.

<b>Reasons Practitioners give for using SAs</b>	<b>Reasons the Literature gives for using SAs</b>
Inform process design	Inform process design, include the right issues
Define issues and interests	Define interests and BATNA
Whether a process should proceed	Determine if process will be successful
Determine who should participate	Include the right key players
Determine relationship dynamics	Opportunity for the mediator to learn about stakeholder relationships
Foster mutual understanding	Develop a value-neutral report of the situation
Build relationship between stakeholders and mediator	“assess the assessor”
Get buy-in from stakeholders	Building trust in the mediator, including the right key players, including the right issues
Develop shared baseline information	Develop a value-neutral report of the situation
Potential options for resolution	Identify barriers and opportunities
The higher the level of conflict the more important the assessment	
Determine willingness to participate	Determine if stakeholders are willing
Determine capacity to participate	Determine if process will be successful
Teach about Mutual Gains Approach	Stakeholders can learn about Mutual Gains Approach
Client put it in scope of work	

A few other reasons given in the surveys, like the client putting the assessment in the scope of the work, were present but not prominent in the literature. The client putting the assessment in the scope of the work is not considered a reason to do the assessment in the literature, but the trigger for the assessment happening in the first place. The other reason not

prominently expressed in the literature, is not a reason, per se, but a guideline for whether or not to do a full assessment. The idea that an assessment becomes more necessary when the conflict is more contentious is reflected in the literature. L. Susskind and Thomas-Larmer (1999) note that the higher profile or more complex a situation, the more necessary an assessment may be. This is not exactly the same as a conflict being more contentious, but the complexity of a situation may reflect how high the level of conflict is. Again, the reasons practitioners have for conducting an assessment, even the less common reasons, are reflected in the ADR literature.

### ***2.5.2 Approaches to SA***

There is a prescriptive outline of steps to a SA. Namely, the assessor is hired by the convener, identifies stakeholders, interviews stakeholders, analyzes the data, and gives a written report to the convener and/or the stakeholders. Many practitioners opt for a quicker and less formal process than what is described in the literature. Both the literature and those surveyed mentioned there are a variety of tools and approaches in the assessment, and that comes across in how the practitioners do their work. For example, Susskind & Thomas-Larmer (1999) emphasize how important a face-to-face meeting is, in a place where the stakeholder is comfortable, and doing so with each key stakeholder. Schenk (2007) corroborates this with a finding that across a set of reviewed assessment reports, most of the mediators used in-person interviews. While this sort of approach was certainly valued by the respondents in this study, it was viewed more as an ideal not always met. According to those interviewed, many stakeholder interviews take place over the phone, and if the interviews are in person, often there is not the time or budget to meet with all of the stakeholders. This difference from what was found in Schenk (2007) may be accounted for by the analysis of written assessment reports as the basis for a ‘state of the

practice' in that paper. Interviewees in this research reflected on how they approached all of their work, not just the projects that included written assessments. If practitioners are less formal in how they collect their data, i.e. doing short phone interviews, those instances may go hand in hand with a less formal approach to reporting.

Similarly, many survey respondents said they opt to analyze SA results by using a simple tally and written synthesis of the more common themes and opinions, over more complex analytical approaches described in the literature, like stakeholder-interest matrices or social network analysis (Reed, 2009). This less formal analytic approach is also reflected in how practitioners choose to report or not report their results. A number of those surveyed reported they view the assessment as an opportunity to get an impression of how to design a process and how stakeholders might work with one another. Some said a formalized written report was either unnecessary, or could lead to more conflict among the parties. It is worth noting one of the alternative approaches offered by Bean et. al. (2007) is to not write a report because it might intensify a conflict.

One important finding on methods that emerged from the interviews was the focus on flexibility and open-ended questions during the interview process. A number of the interviewees were adamant the assessment was not a survey, or a scientific instrument, but more of an art.

Assessment work [is distinguished] from survey work or some place where you are being very careful to replicate your methodology. I think we want to be careful not to replicate it. We want to meet people where they are and find out what's important [to them]. I think that flexibility is a good thing. [For one person], I would ask one open-ended question and they are off and running, and for other parties, you know they kind of want to be interviewed, and I go in an orderly way through my list of questions-it all depends. (ADR interview 6, August 2016).

Flexibility and openness during the interview process is recommended in the literature, but seems to be taken to a more extreme end by practitioners. Interviewees spoke about how interview questions changed throughout the course of the assessment process. While the literature is clear that an interview protocol should be created at the beginning of the assessment and shared with stakeholders before interviews, experienced practitioners seemed to have broken away from a set format. Some talked about sets of questions completely changing by the end of an SA and focusing on having engaging conversations over answering particular questions. Practitioners used the interview process to get an impression of the situation, the relationship dynamics, and the key interests of stakeholders. Engaging stakeholders in a comfortable and flexible conversation is the most effective way to reveal this information and allow the mediator to capture the nuance in a situation.

### ***2.5.3 Creating Conditions for Successful Collaboration***

Table 2.7 shows how conditions for successful collaboration are or are not met by assessment outcomes, as identified by environmental ADR practitioners. Some of the conditions for collaboration are the explicit purpose of conducting the assessment in the first place, according to the interviews. Having an understanding of stakeholder interests and gathering, or developing a basis for, complete and transparent information are explicit reasons practitioners conduct SAs, and are foundational for a successful process. Mediators and stakeholders begin to understand stakeholder interests as they work together to identify interests and BATNAs. Gathering complete and transparent information comes from talking to stakeholders about the issues and their interests in a conflict and cutting through outlandish positions and



misinformation to determine the reality of a situation. Getting a broad representation of stakeholders or finding the right players was also a reason the assessment was conducted, and was achieved by capacity-building and coaching. Those groups that were unorganized or had no clear leadership were sometimes coached during the assessment so they would be able to represent themselves, giving the process a broader set of stakeholders.

Other conditions were not explicit goals of conducting the SA for practitioners, but were addressed as potential outcomes. Creating trust among the stakeholder groups through the assessment itself was deemed unlikely by most interviewees, as described in the Limits of the SA section above. However, one interesting finding is the emphasis from the interviewees on building relationships and trust between themselves, as the mediators, and the stakeholders participating in the process. This was not emphasized as the express purpose of SA in the literature, but was highlighted by interviewees, who deemed relationship building a necessary condition for being able to move a process forward. For example, at the time of our interview, one practitioner had recently had her relationship with a group of stakeholders undermined by another stakeholder and was concerned how the rest of her project could be successful if trust could not be restored (ADR Interview 1, October 2016).

Table 2.7. Conditions of successful collaboration as they match with outcomes practitioners viewed coming from SAs.

<b>Conditions</b>	<b>Assessment Outcomes</b>
Interest in dealing with the situation	Advocating for collaboration or ripening the situation
Understanding stakeholder interests	Defining Interests and BATNAs
Recognizing interdependence	Considering other parties' perspectives, broadening scope of issues
Broad representation of stakeholders	Capacity building and coaching
Early engagement	
Trust among the stakeholder groups	Building relationships with mediator
Complete and transparent information available	Reality checks
Available time and financial resources	
Experienced and skilled mediator	

Some of the conditions for successful collaboration may precede the outcomes a mediator can get from an assessment and are often not brought about by the assessment itself. Having available resources for a process, interest in dealing with a situation, or having an experienced and skilled mediator involved in the process are all conditions that can be met prior to the assessment. However these factors did come up in the discussions with practitioners. Every practitioner interviewed was considered to be experienced. While no one said outright their processes were successful because of their own expertise, this was implied in many of the interviewees' responses. Statements about using one's judgment to determine the situation and relationship dynamics, as well as how the process should be designed, indicated practitioners viewed their own skills and experience as important in leading to a successful collaboration. The interest in dealing with a situation, which seems like it would be up to the stakeholders

themselves, was also a condition some practitioners spoke about affecting. At least three practitioners spoke about advocating for collaboration or ripening a situation during the SA so a process could move forward. They used the SA to create more interest in the situation and actively brought about a collaboration where one was not expected or known to be desired by the stakeholders.

Lastly, it is important to note these interviews were conducted to learn about the impact of an SA on stakeholder's perceptions of interdependence. This was not expressly brought up with every interviewee, but when it did come into the conversation, their reaction depended on their own philosophy and approach to mediation. When it did come up, some practitioners did consider how the interviews and outcomes of the SA could affect how stakeholders viewed their situation. Others were skeptical of people being able to see beyond their own position without being shaken out of it by a full collaborative process. No one had evidence one way or another, just their own gut feelings. However, if perception of stakeholder interdependence is defined as how relationships are viewed and perception of SES interdependence is defined as how the issues of a situation are viewed, practitioners did recognize an impact to perception of interdependence. This was shown in the examples of how stakeholders came to view a situation from other parties' perspectives and think about integrative solutions, and in stakeholders' consideration of new and broader issues as part of defining a situation. So while practitioners were unsure if changes in recognition of interdependence were possible, they did confirm through their anecdotes that change of recognition of interdependence was possible.

## **2.6 Summary and Conclusions**

Most of the practitioners surveyed and interviewed in this study value using an SA in at least some form. The available time and budget for a mediated process is highly dependent on the convener and the participating stakeholders. In order to conduct a formal, or at the very least effective assessment, some amount of resources and access to stakeholders has to be made available to mediators. A few surveyed and interviewed practitioners mentioned not doing an assessment or doing a pared down assessment because the client didn't want one or was not willing or able to provide the time or budget for one. Other clients didn't understand why an SA was necessary.

However, clients may want to consider the outcomes possible from an SA and how they can contribute to a more successful collaboration. Not only are assessments important for addressing the logistical issues of a collaborative process like process design, stakeholders to involve, and issues to focus on, but also they appear to have an impact on the less tangible aspects that can make or break a mediation. The assessment is an opportunity for stakeholders to begin to trust the mediator, and in turn, the process the mediator designs. It can be a time for stakeholders to prepare how they approach one another, and it can even be an opportunity for them to begin to appreciate around where the other parties are coming from.

This research examines the role of SAs in the success of collaborations and the attitudes of stakeholders. A wider survey and more interviews could have exposed some more nuance to what can possibly come out of an SA and how those outcomes may impact the success of a collaborative process. When asked about the attitudes and perceptions of the stakeholders they had worked with, most interviewed practitioners indicated they could not know because they had

never asked. In Chapter 4, this aspect is explored by researching the impact of SAs on participants in a case study in Seabrook, NH.

How closely do the reasons and methods for SA in the literature match what environmental ADR practitioners do in practice? The reasons mediators conduct SAs match closely with the reasons given in the literature, with an emphasis on process design, defining interests, learning about relationships, and determining if the process should go forward. Mediators' approaches to SA reflect what is recommended in the literature, but do depart in some aspects. The literature's emphasis on interviews is upheld in practice, but the approach is more flexible, from the content of the interview, which can deviate far from the protocol, to how the interview is conducted, which is preferred to be in person, but in practice often occurs over the phone. The practice also deviates from the literature in respect to communicating the results of the analysis back to the stakeholders- practitioners varied in how they reported the assessment according to the situation, and did not follow the recommendation to always share a written report with stakeholders.

How do the outcomes of the SA meet the conditions for creating a successful collaboration, particularly stakeholders recognizing interdependence? Key outcomes of SAs, like developing trust in the mediator, defining interests and BATNAs, and even advocating for collaboration can lay the groundwork for a successful process to come. Practitioners didn't think SA could change perceptions of interdependence but had never actually asked stakeholders if their views had changed. However, they provided examples of SA during which participants experienced changes in perception of both SES and stakeholder interdependence: broadening the scope of issues considered relevant and considering other parties perspectives and integrative

solutions. In chapter 4, I further explore this concept by asking stakeholder participants how their perceptions of interdependence changed over the course of a SA.

## **Chapter 3**

### **SA Report of Beach and Dune Management in Seabrook, NH**

Chapter 3 captures the results of an SA report of beach and dune management issues in Seabrook, New Hampshire. The assessment report was prepared as part of the “Human and Ecological Interactions in Dune Systems” research project. On June 28<sup>th</sup>, 2017, a draft report was sent to 30 people who participated in the SA surveys, interviews, and workshops. Participants were invited to provide any clarifications they thought important for finalizing the report. This penultimate draft reflects input from 10 participants who responded by July 14<sup>th</sup>, 2017, the deadline for inclusion in this thesis. The final version of the SA report will include all comments received by August 31<sup>st</sup>, 2017 and will be publicly available in the UNH Scholars’ Repository. Chapter 3 is expanded to give more technical information on the methodology used to conduct the SA.

#### **3.1 Project Overview**

The “Human and Ecological Interactions in Dune Systems” research team is an interdisciplinary group from the University of New Hampshire (UNH), UNH Cooperative Extension, and New Hampshire Sea Grant working with local, state, and federal partners in seacoast towns in New Hampshire and Massachusetts on the ecology, outreach, and social science of dune and beach management. This project is focused on Seabrook, NH and is funded by New Hampshire Sea Grant with significant match from the University of New Hampshire, University of New Hampshire Cooperative Extension, the Town of Seabrook, NH Sea Grant Coastal Research Volunteers, and additional local volunteer efforts from community and local area schools. The project has three linked objectives:

**1. Understand the extent and causes of beachgrass die-off and develop response strategies.**

Local observations suggest that American beachgrass is dying-off in patches in Seabrook, making the dunes more vulnerable to erosion, but the exact cause is unknown. Our team is mapping and collecting beachgrass samples to determine the most likely cause of die-off, beginning work to combat the cause, and planting affected areas with native species.

**2. Engage local residents, community leaders, and volunteers.** Local community members are participating in many outreach and research activities, such as growing and harvesting plants at the Common Garden in Hampton Beach, surveying and collecting samples from beachgrass die-off areas, and planting native dune species.

**3. Dune and Beach Management Stakeholder Assessment.** Our team is identifying stakeholders' priority issues for dune and beach management in Seabrook, summarizing their perspectives, and considering the need for and possible structure of a collaborative problem solving process.

This report is a written summary of the SA we conducted February 2016 - June 2017. We began with discussions with the Seabrook Hampton Estuarine Alliance (SHEA), the Seabrook Planning Board, and the NH Coastal Adaptation Workgroup. We then surveyed and/or interviewed 30 stakeholders from 23 different groups or organizations, with some participants representing more than one group. Our research team asked participants:

- **3.2** What dune and beach management issues are important to you and why?
- **3.3** Are there gaps in scientific knowledge that need to be filled about Seabrook's dune and beach system?
- **3.4** Are there outreach needs for engaging people and informing them about Seabrook's dune and beach system?



- **3.5** Are new dune and beach management arrangements needed?

Survey and interview participants were identified based on their interest in how the beaches and dunes are managed in Seabrook, their potential influence on management, or because other participants recommended we contact them. Interviews were conducted in person, lasted from one to two hours, and most were audio-recorded. Interviews were transcribed or careful notes were taken if the interviewee did not want to be recorded. Although interviewees included both men and women, throughout this report we refer to all with the pronoun “he” in order to protect anonymity. We grouped participants into four stakeholder categories (Figure 3.1):

- Town of Seabrook and Rockingham County: Board of Selectmen, Town Manager, Department of Public Works, Planning Board, Wastewater Department, Conservation Commission, Recreation Commission, Department of Emergency Management, Budget Committee, State Representatives, Rockingham Planning Commission
- Seabrook Beach Village District: Commissioners, Zoning Board of Adjustment, Beach Civic Association, Business Owner, Seabrook Hampton Estuarine Alliance (SHEA)
- State and Federal Agencies: US Fish & Wildlife, NH Fish & Game, NH DES Wetlands Bureau, NH Natural Heritage Bureau, NH Port Authority, NH DES Coastal Program
- Researchers: University of New Hampshire scientists from the “Human and Ecological Interactions in Dune Systems” project who are engaged in dune restoration activities in Seabrook

### Survey and Interview Participant by Stakeholder Categories

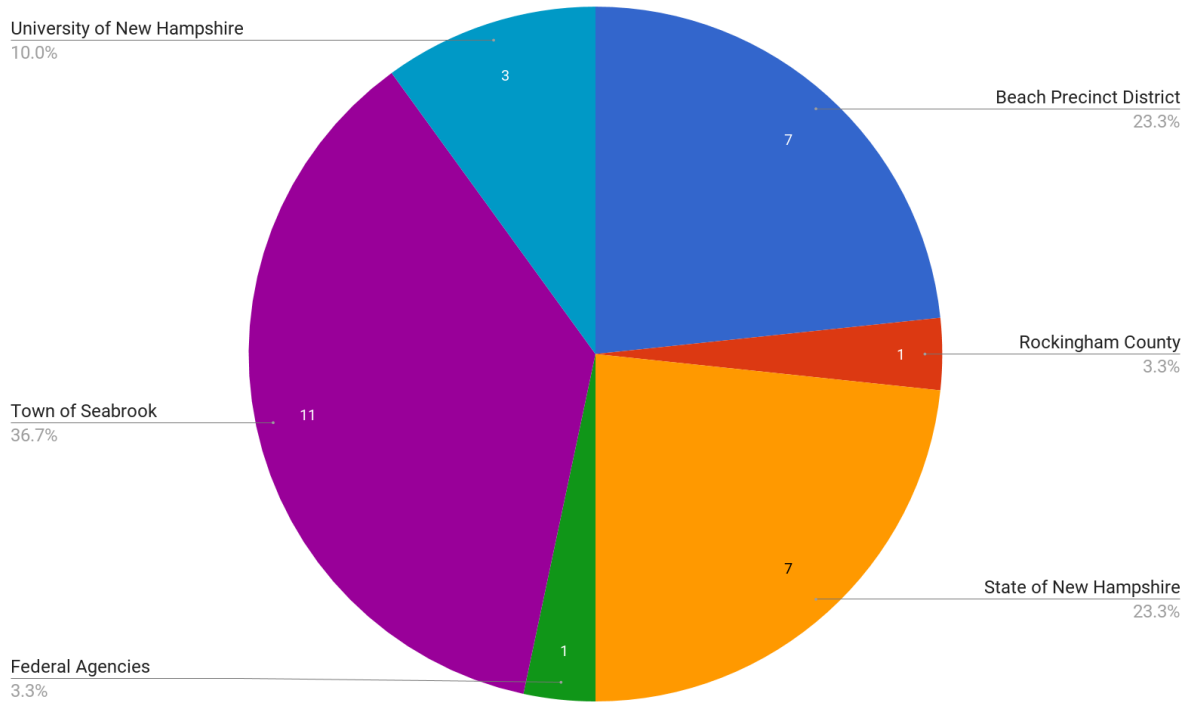


Figure 3.1. A breakdown of the participants in the assessment and the stakeholder categories to which they belong.

We then held a series of two workshops open to interview participants and the public, which were hosted by the Seabrook Beach Village District. Workshops were advertised on the public access channel, on flyers posted around Seabrook, and in emails to SA participants. The first workshop, held on March 27<sup>th</sup>, 2017 at the Seabrook Beach Precinct Building, focused on dune health and ecology. In the second workshop, held at the Seabrook Library on April 18<sup>th</sup>, 2017, 20 participants focused on a summary of key points from the interviews and surveys and engaged in an idea gathering session around opportunities for collaboration around coastal resources, coastal development, and harbor dredging.

Interview transcripts and notes from our workshops were analyzed for issues and potential solutions. Data were organized by issue and stakeholder group, with a focus on priority issues.

Collected data were analyzed to determine areas of agreement and disagreement among stakeholder groups. **The SA report is a summary of the results of our analysis and identifies stakeholders' priority issues, their perspectives on these issues, areas of agreement and disagreement, and recommendations for collaborative problem solving around dune and beach management in Seabrook.** A draft report was emailed to the 30 people who participated in the survey and interviews for clarifying comments; the report was revised based on the comments received.

The UNH team that prepared this SA included Dr. Catherine Ashcraft, Assistant Professor in the Department of Natural Resources & the Environment, and Emily Bialowas, a graduate student in the same department. The authors are grateful to the participants who contributed their perspectives, but take full responsibility for any errors in interpreting their responses.

### **3.2 What dune and beach management issues are important to you and why? Which issues are most important to you?**

The four issues most stakeholders consider priorities for dune and beach restoration are: Dune protection; Wildlife and wildlife habitat protection; Beach access and recreation; and Planning for disposal of sediment from the planned harbor dredging for beach nourishment.

#### ***3.2.1 Dune protection***

##### *Summary*

All interviewees said they value Seabrook's dunes as the most intact dune system in the state of New Hampshire and that the dunes should be protected from negative impacts. Opinions vary on the health of the dunes. Some said the dunes are healthy and growing to the point of

encroaching on private property. Some said the dunes are fragmented and they are concerned about private property owners encroaching on the dunes. In general, stakeholders vary in what they perceive to be the most significant threats to the dune system and how best to address these, but agree that better coordination of and communication about their efforts would be helpful. Most interviewees said there is a need for better efforts to limit encroachment of private property over the dunes and better enforcement of existing restrictions on human activities that negatively impact the dunes.

#### *Beach Village District*

Most interviewees said dune and beach management is important to them. Many beach residents said the dunes appear to be in very good shape and do not seem to need dune restoration. Some said they were concerned about the growth of the dunes and the encroachment of dunes on private property. One interviewee was concerned about the possible effect of dune growth on property values. Many expressed concern about growth of beachgrass toward the ocean, which could limit beach access. A few said they were concerned about dune erosion north of Hooksett Street and near the bridge.

Many interviewees said encroachment of private property onto the dunes is a serious problem that has been going on for some time with inadequate response. Most said visitors do not respect the dunes enough, for example by allowing children to play in them, using illegal fireworks, lighting bonfires, leaving trash, and disregarding dog leash laws. One said the planting of invasive species on private property is a concern for dune health.

#### *Town of Seabrook and Rockingham County*

All interviewees said they appreciated the uniqueness of having NH's only relatively intact dune system and expressed the need to preserve it for future generations. Some said they

perceive the dunes to be robust and healthy, even growing larger and towards the water. Some expressed concern about fragmentation of the dune system and singled out the dune remnants on the west side of Route 1A. A few Town staff and residents said they don't know if the dunes are eroding or growing. Many interviewees said encroachment of private property over the dunes is a significant threat. Many said human activities pose a threat to the dunes, including people walking on the dunes, children playing in them, and the use of illegal fireworks. Many said they don't know whether beachgrass die-off is a significant threat. Some interviewees also said not enough funding is available for dune restoration activities.

#### *State and Federal Agencies*

Interviewees all said they view the Seabrook dunes as a unique resource in NH and protecting them is a high priority. All said the dunes provide important flood protection benefits. Most interviewees expressed concerns that the dunes could be healthier, for example by better connecting the foredunes and the back dunes and restoring sand connectivity. Most said they would like to restore the dunes and funding for dune restoration is available. All mentioned limits to dune restoration posed by a variety of factors, including coastal development, the need for residents to have access to the beach, and the need to provide sparsely vegetated habitat for Piping Plovers. One said preserving unique and rare plant species is important. All said detecting and deterring wetlands permit violations in the dunes is a high priority.

#### *UNH Researchers*

All interviewees said they are seeing evidence of die-off of American beachgrass in Seabrook. The level of die-off is mild in comparison to some nearby coastal areas, but they said they do not know how it will progress. All said they are concerned the die-off will affect the integrity and stability of the dunes, their vulnerability to storms, and their ability to provide flood

protection because beachgrass helps build up sand dunes and stabilize them from the erosional effects of storm winds and surges.

### ***3.2.2 Wildlife and Wildlife Habitat Protection***

#### *Summary*

All interviewees agree on the need to protect Piping Plovers and their habitat. Most agree human access restrictions during nesting season should be reasonable and should be better monitored and enforced. Many also said better outreach is needed to residents and visitors about plover restrictions. Some also said communication on this issue should be improved between agencies, the Town, and the Beach Village District.

#### *Beach Village District*

Most interviewees said they are interested in managing the beach and dunes to help Piping Plovers fledge successfully in the shortest time possible in order to minimize restrictions to beach access.

#### *Town of Seabrook and Rockingham County*

All interviewees cited the need to comply with the Endangered Species Act to protect Piping Plovers from people and predators and most said this was a high priority for them. A few described how the Department of Public Works and the Beach Village District Commission coordinate with NH Fish & Game on beach raking, Piping Plover monitoring, and Piping Plover fencing. A few Town staff and residents cited concerns about the aesthetics of plover fencing.

#### *State and Federal Agencies*

All interviewees said compliance with the Endangered Species Act requirements for Piping Plover breeding success and habitat conservation is a high priority, including respect for

plover exclosures, better enforcement of dog leash laws, and fewer illegal fireworks, which disturb nesting plovers. Some said NH Fish & Game is already coordinating with the Town on Plover protection and beach access and raking in order to make beach access restrictions reasonable and effective.

#### *UNH Researchers*

All interviewees said dune habitat should be protected and native plantings encouraged.

### **3.2.3 Beach Access and Recreation**

#### *Summary*

All stakeholders said maintaining access to the beach is a priority, but interviewees' opinions vary on who should have easy access and how access should be provided. Some said public access is important. Some stakeholders prioritize direct access from beachfront homes to the beach. Some prioritize access for all Town residents through public pathways. All said more outreach and better enforcement of existing restrictions are needed to ensure human activity does not negatively impact the dunes. Most said staffing, time, and budget constraints limit the ability to enforce existing beach access restrictions.

#### *Beach Village District*

Interviewees said maintaining convenient access for beach residents to the beach is a high priority. Most interviewees with beachfront homes said it is important for them to have access to the beach from their homes in the summertime, especially to ensure children have safe access to the beach. Some said beach aesthetics are important, including beautification efforts, trash clean up, and raking. These interviewees also said existing restrictions on human activity need to be better enforced, including laws about dog leashes, but said visitors are particularly difficult to

reach, especially with limited capacity for policing and outreach.

#### *Town of Seabrook and Rockingham County*

All interviewees said they want to maintain convenient access to the beach and a beach bathing area for residents. Most said enforcing dog leash and clean up rules is important, as is cleaning up trash. Some said parking regulations should be better enforced.

#### *State and Federal Agencies*

All interviewees said maintaining, and most said improving, public access and recreation opportunities are important. Most also said it is important to manage human activity to ensure recreation does not negatively impact the dunes.

#### *UNH Researchers*

All interviewees said human access and recreation should be managed to minimize negative impacts on the dunes.

### **3.2.4 Harbor Dredging Sediment Disposal/Beach Nourishment Planning**

#### *Summary*

All interviewees agree on the need for the harbor to be dredged and the Town to decide if it wants dredge material deposited on the beach. All also agree on the need to better understand Seabrook beach's sand and dune dynamics. In the event dredge material will be deposited on the beach, most stakeholders agree that representatives from the Town and Beach Village District should participate in efforts to coordinate, manage the impacts, and minimize conflict.

#### *Beach Village District*

Some interviewees said they were not sure whether the beach needs nourishment. If it does, they expressed concerns about the aesthetics of depositing dredged sediment on the beach



as the sediment that was deposited on the beach from the last harbor dredging initially appeared dirty until it became weathered. Some beach residents also said they are concerned that depositing dredge material could lead to additional beach access restrictions as the last time sediment was deposited on the beach, fencing was put up without notice to limit access to improved Piping Plover habitat.

#### *Town of Seabrook and Rockingham County*

Some interviewees said the Town should decide whether it wants the dredge material deposited on the beach.

#### *State and Federal Agencies*

All agencies concerned with fishermen and navigation said priorities are dredging the harbor and encouraging the beneficial use of dredge material for beach nourishment and maintaining or enhancing Piping Plover habitat, or at least avoiding adverse effects. Some said they don't know whether Seabrook's beach needs nourishing.

#### *UNH Researchers*

All interviewees said better understanding sand dynamics at Seabrook's beach is important.

### **Other issues that factor into dune and beach management efforts**

Interviewees mentioned the following related issues as having an impact on or being affected by dune and beach management:

- Stakeholders in all categories mentioned the need for Seabrook to improve its storm readiness planning to increase flood protection for public safety and infrastructure and reduce vulnerability to flooding from storm surge and sea level rise.
- Some interviewees from the Town of Seabrook and Rockingham County and the Beach

Village District said it is important to reduce fire hazard and increase awareness of public safety hazards in general.

- One interviewee said the Beach Village District should collaborate more with other Village Districts and Seacoast communities that are facing similar issues.
- A few interviewees from the Town of Seabrook and Rockingham County said it is important to maintain the Town's tax base and support for services.
- A few stakeholders from the Town of Seabrook and Rockingham County and the State and Federal Agencies said it is important to fund and maintain harbor infrastructure for the fishing industry, including the pilings and docks.
- Some stakeholders across several categories said protecting salt marsh and salt marsh migration opportunities is important.

### **3.3 Are there gaps in scientific knowledge that need to be filled about Seabrook's dune and beach system?**

#### ***Summary***

Stakeholders generally agree that gaps in scientific knowledge exist. Interviewees across all categories said research is needed to better understand how the dune system is changing and whether the dunes are growing or eroding. Most interviewees said there is a need for better understanding of the significance of beachgrass die-off and strategies to address it.

#### ***Beach Village District***

Most said research is needed on dune growth and beachgrass growth. Many interviewees said it is important to understand strategies to address beachgrass die-off. One resident said there is a need for research about how sea level rise affects Piping Plover nesting.

### ***Town of Seabrook and Rockingham County***

A few town staff and residents said they would like to see more research about how the dunes are changing to know if they are eroding or growing. Many said they wanted more information about whether beachgrass die-off is a significant threat.

### ***State and Federal Agencies***

Most interviewees said research is needed to better understand Seabrook beach profile and dune system dynamics to inform decisions about beach nourishment. Some said such research would also bring attention to the significance of NH's only beach with thriving dunes. One said research should include the impact of storms. One said there is a need for research about how sea level rise and storms affect Piping Plover nesting.

### ***UNH Researchers***

All said they are interested in conducting research that is relevant to stakeholders. The researchers identified the following known research needs: dune system dynamics and tracking the beach profile, understanding threats to the dunes, including identifying the extent and cause of beachgrass die-off, developing strategies to address die-off, understanding the cumulative effects of human impacts on the dunes, and understanding the dune width and height that are needed to protect homes and infrastructure. All said one research opportunity is to include Seabrook beach as a site in the expanded beach profiling project. The beach profiling project tracks changes in how sand moves over time for select NH beaches. This project is led by NH Sea Grant, UNH Cooperative Extension, and the UNH Center for Coastal and Ocean Mapping, with support from the New Hampshire Geological Survey. Beach profile data are collected by teams of Coastal Research Volunteers, who take detailed measurements of the contour of New Hampshire beaches once a month and after storms. This information is intended

to (1) increase understanding of beach dynamics across seasons and years as well as understanding of how beaches respond to storms and (2) be useful for town and state decision makers in guiding beach management. The pilot year of the NH beach profiling project ends in summer 2017, after which the project team will begin expanding the volunteer profiling network to additional NH beaches. The project is funded by NOAA's Office for Coastal Management under the Coastal Zone Management Act in conjunction with the New Hampshire Department of Environmental Services Coastal Program.

### **3.4 Are there outreach needs for engaging people and informing them about Seabrook's dune and beach system?**

#### ***Summary***

All interviewees agree on the need for outreach about the value and significance of the dunes, about the impact of human activities on dunes, and about ways to protect them. Some stakeholders are interested in better outreach for residents and visitors about restrictions on beach access and recreation.

#### ***Beach Village District***

Most interviewees said better outreach is needed to inform visitors and residents about the value and significance of dunes for flood protection, about the negative impacts of recreation on the dunes, the risks posed by bonfires and fireworks, and about strategies to protect the dunes. Some said these issues should be included in school curricula. Some expressed frustration with the challenge of reaching short-term renters and seasonal visitors and thought more welcoming and informative outreach should be provided to them. Most also said they would like better communication to residents about beach access restrictions.

### ***Town of Seabrook and Rockingham County***

Most interviewees said more outreach is needed for residents about dune function and shoreline processes, about the significance of the dunes to the Town, about dune fragility and the impacts of human activity on them. Some said they were interested in learning more about the impact of sea level rise on local flooding and how the dunes protect the Town. One interviewee said there is high turnover among Town zoning officials and he thought additional training for them and other Town staff about the dune system would be helpful. Many interviewees said they would like better outreach about restrictions that are needed due to Piping Plovers, such as beach raking restrictions. Most said it is important to encourage the use of public pathways. If the Town decides it wants the dredge material, some said there should be outreach about the initial dirty appearance of the sediment.

### ***State and Federal Agencies***

Most interviewees said they would like to see more funding for education and outreach to foster awareness about the dune system and dune dynamics, such as their sacrificial nature, about the impacts humans have on dunes, and about the flood protection dunes provide. Most interviewees expressed an interest in citizen science initiatives that engage the public in place-based science for dune and beach planning. Some said they would like to engage the public in Plover protection.

### ***UNH Researchers***

All interviewees said they are interested in continuing existing outreach efforts and developing new outreach initiatives to engage more Seabrook residents. Existing dune restoration outreach efforts include the community garden at Hampton Beach State Park and local dune plantings. Interviewees said new outreach opportunities could engage Seabrook

residents in citizen science through a beach profiling project site at Seabrook beach or efforts to monitor dune vegetation and beachgrass die-off. Some said they were interested in developing school curricula about the Seabrook dune system and its significance.

### **3.5 Are new dune and beach management arrangements needed?**

#### ***Summary***

Although most interviewees are generally satisfied with the current state of beach and dune management, all interviewees agree it could be improved through additional collaboration. Most interviewees are willing to participate in a collaborative planning effort, but all said they have time and resource constraints. Interviewees across categories said such an effort should aim to improve detection and deterrence of private property encroachment over the dunes. Some said they would like to see efforts to improve enforcement of restrictions on activities that harm the dunes. Some said collaborative planning should aim to strengthen communication around disposal of dredge sediment for beach nourishment. Interviewees across many categories said a planning effort should aim to address connected issues together, including encroachment, management of the dunes, beach, and sand, and beach access restrictions. Some said they are interested in a process to engage residents and include their input in updating the beach management plan.

#### ***Beach Village District***

Most interviewees said they are generally satisfied with the current management of Seabrook's dunes and beach, but all said there were issues important to them where management could be improved. A few said an updated beach management plan is needed. Most beach residents we interviewed said they are willing to collaborate on planning and decisions affecting

the dunes and beach.

All beach residents we interviewed said any collaborative problem-solving effort should include improving enforcement of existing rules on human activities in the dunes. Many specified they wanted more enforcement of rules prohibiting fireworks and bonfires, dog leash laws, and trash clean up rules. Some interviewees said personnel and budget limits prevent the Seabrook Police and Fire Departments from dedicating more hours to the beach to patrol, detect, and enforce undesirable or illegal activities, particularly during peak times in the summertime and evenings. Most said better communication is needed to inform residents about beach access restrictions during Piping Plover nesting time. A few said they wanted more monitoring of human activity around plover nests.

Many interviewees said another high priority for them is to improve detection and deterrence of wetlands permit violations to limit encroachment of private property onto the dunes. Many expressed frustration with the Beach Village District's lack of authority to enforce encroachment violations. Interviewees had different ideas about what is needed. Some said coordination between the Town and State should be stronger to foster better enforcement and avoid conflict. One interviewee said he would like to see quicker follow up from NH DES when wetlands permit violations are reported. One said better information about restrictions would be useful for homeowners and builders. Another said there should be more publicity about violations. A few interviewees said they'd like to see less disturbance permitted and more mitigation required in the event of disturbance. One suggested developing zoning rules for new construction, such as patios.

If the beach needs nourishment, some interviewees said they want better communication with residents about the aesthetics of the sediment from the harbor dredging and about beach

access restrictions due to improved Piping Plover habitat.

### ***Town of Seabrook and Rockingham County***

Most interviewees said they are generally pleased with the current management of Seabrook's dunes and beach, but some said there could be improvements, better collaboration, and residents should be more engaged in beach planning. A few interviewees mentioned Seabrook's new Master Plan chapter on Coastal Hazards and Climate Adaptation, the first such chapter in New Hampshire, as providing a foundation for future dune and beach management planning. A few interviewees said the Town should comprehensively and proactively plan its shoreline management by considering issues that are connected, including sand management, land preservation, and development rules, and through discussions with the State. One interviewee said the Town Planning Board should work with the Beach Village District on proactive strategies to address the issues raised in this SA. One interviewee said Seabrook's legislators should be engaged in this process. All interviewees said they are willing to collaborate in dune and beach management planning, if time and resources permit. One interviewee suggested the Town could hire a grant writer to work specifically on coastal resilience issues.

Some said the update of the Beach Management Plan, scheduled for 2019, provides an opportunity for improving collaboration around dune and beach management. Some interviewees said they are interested in a process for the public to provide input into the Plan. One interviewee said the Town should prepare a Capital Improvement Plan for beach management.

Some said the Town needs a process to decide whether it wants the harbor dredge material deposited on the beach. Most said they were happy with the collaboration in the past few years between the Town, State, and Beach Village District around protecting Piping Plovers.

Many interviewees said collaboration should address improving detection and deterrence



of encroachment of private property over the dunes. Interviewees had mixed opinions about which strategies should be pursued. Some said the Beach Village District should enact new zoning rules to require building permits for outdoor projects, such as patios. Some said Town-level strategies are needed: providing more information to prospective buyers and new owners about property and Town boundaries, increasing monitoring and policing of encroachment, more coordination between Seabrook's Zoning Board, the Planning Board, the Conservation Commission, and the Board of Selectmen, and better communication between the Town and the Beach Village District about violations and enforcement actions. In general, interviewees from the Town said they face significant staff, financial, and time constraints to address encroachment. One interviewee said he was concerned the Town could be sued for enforcing actions against encroachment because of perceived inconsistencies in how the State enforces dune regulations and requires mitigation actions for permit violations. Another interviewee said better communication is needed between the Town and State about violations and enforcement actions. Some said State-level strategies are needed, including wetlands permitting that is more supportive of local development controls and more State enforcement of encroachment. One respondent said the State should allocate more mitigation funds to the Town or keep mitigation funds within the watershed.

Most interviewees said improving enforcement of existing access restrictions should be addressed, including dog leash laws, trash clean up rules, and parking regulations.

### ***State and Federal Agencies***

Most interviewees said they are generally satisfied with how the dunes and beaches are managed in Seabrook, but mentioned several opportunities for improving collaboration. Many interviewees said their capacity to address these issues is constrained by limited time, staffing,

and resources. Within these constraints, all said they are willing to participate in a collaborative process by providing technical assistance and advice to the Town.

Most interviewees said they are interested in better managing human activity to ensure recreation does not negatively impact the dunes. All interviewees said it is important to maintain, and most said to improve, public access and recreation opportunities. Some said increased outreach and communication is still needed about beach access restrictions and Piping Plover management. A few said beach access planning should consider limiting foot traffic and addressing beachgrass die-off.

All interviewees said improvement in detecting and deterring wetlands permit violations in the dunes is a high priority. One added that an approach is needed to deter contractors from repeat violations. Some said the State's roles in limiting private property encroachments are primarily to support the Town through advice or funding and to enforce violations of permits, yet most also said the State lacks staffing for permit compliance checks. One said communication between the State and Town about violations should be improved. Some said implementing the updated Wetlands Rules, which are in the process of being adopted, is an opportunity for more collaboration between the State and Town.

Some said there is an opportunity for improving communication with the Town and Beach Village District around planning for dredge material disposal for beach nourishment. In the past, some interviewees said there has not been much communication between the Town of Seabrook, the Beach Village District, and the Dredge Management Task Force. The Dredge Management Task Force is an interagency work group, currently chaired by NH DES Coastal Program, which provides technical and regulatory advice related to dredging activities. If federal funding is allocated, the harbor could be dredged as soon as 2018. Most interviewees said the

Town should decide if it wants the dredge material for beach nourishment. If it does, some interviewees said the Dredge Management Task Force should engage representatives from the Town and Beach Village District to coordinate beach nourishment planning and improve outreach and communication about any beach access restrictions.

Several interviewees said there was a need for longer-term dune management strategies. Two said a long-term plan for Seabrook beach nourishment is needed that includes an understanding of the sand dynamics and the effects of disturbance. One interviewee said the Town needs a post-storm recovery plan. A few interviewees said the Beach Village District should adopt storm ready building and zoning codes. One interviewee said increased public engagement in dune and beach planning and related decisions is important.

### ***UNH Researchers***

All UNH researchers said they have some concerns about how Seabrook dune and beach stakeholders will address existing and new challenges, such as beachgrass die-off and increasing storm surge. All said strategies to address these challenges should include managing human access and recreation to minimize negative impacts on the integrity of the dunes and protect dune habitat. Interviewees mentioned several ideas, including encouraging native plantings, restoring impaired dunes to provide better storm protection to homes, and elevating town paths over the dunes. Depending on capacity and funding, all said they are willing to collaborate on management issues in an advisory role.

### **3.6 Recommendations**

We recommend initiating a collaborative process focused on providing input to updating the beach management plan, with subgroups focused on (1) the imminent decision on the use

harbor dredge material to nourish Seabrook beach and related issues, and (2) short-term strategies to address gaps in scientific knowledge and meet some outreach needs. If successful, this process can form the basis for a longer-term collaborative process focused on a broader range of issues.

The timing is appropriate for initiating a collaborative process as the Town's recently adopted Master Plan chapter on Coastal Hazards and Climate Adaptation provides a foundation for future dune and beach management planning, new Wetlands Rules are in the process of being finalized, there is sufficient time to provide input to upcoming decisions and planning processes, and there are no acute conflicts among stakeholders. Most interviewees mentioned time, staffing, and funding constraints on their ability to participate, which need to be taken into consideration.

***Recommendation 1: Form an advisory group of about 20 stakeholders to work in a structured way on providing input for the 2019 beach management plan update.***

This group should aim to develop guidelines for management practices to address the key issues raised in this SA:

- improving detection and deterrence of private property encroachment over the dunes
- sustaining public beach access and recreation
- improving enforcement of restrictions on activities that harm the dunes
- protecting wildlife and wildlife habitat and limit human activities in the dunes that negatively impact Piping Plovers
- planning for sand management and beach nourishment
- collaborating with researchers to address gaps in scientific knowledge
- planning outreach initiatives for residents and visitors and school curricula about the value

and significance of the dunes and the responsibility to protect them

- improving communication between Town Departments, Commissions, and Boards, and between the Town, the Beach Village District, and state and federal agencies

Participants could include representatives from the relevant Seabrook Departments, Commissions and Boards, including the Board of Selectmen, Town Manager, Planning Board, Conservation Commission, Emergency Management, Fire, Police, and Public Works, from the Beach Village District, including the Beach Village District Board, Zoning Board of Adjustment, and Building Inspector/Code Enforcement, from the Beach Civic Association, SHEA, Seabrook's legislators, UNH researchers, and representatives from the Rockingham Planning Commission and State and Federal agencies, including NH Fish & Game, NH DES Wetlands Bureau, NH DES Coastal Program, U.S. Fish & Wildlife.

In order to address stakeholders' constraints, this group should limit the number of full-group meetings, for example three to four per year. Encouraging participation of individuals who are members of multiple stakeholder groups, and can therefore serve as liaisons to these groups, would limit the number of total participants and make it easier to coordinate meetings. The process should be facilitated to be efficient and effective. Depending on capacity, Rockingham Planning Commission and/or UNH, with support from the NH Coastal Program, can facilitate the process and provide support between meetings. The Beach Village District, the Town, and Rockingham Planning Commission should work with UNH Cooperative Extension to develop outreach materials to address specific needs.

***Recommendation 2: Form a subgroup focused on the current need for the Town of Seabrook to decide if harbor dredge material should be used for nourishment of Seabrook beach.***

A subgroup should focus on the upcoming decision of whether Seabrook wants to use harbor dredge material to nourish the beach to combat erosion and on conducting outreach about the decision and its implications. The timeline for the decision will be determined by federal allocation of funding for harbor dredging, but could come as soon as 2018. Most likely, data about Seabrook's beach profile and sand and dune dynamics will not be available in time to determine the need for Seabrook beach nourishment. To address this knowledge gap for longer-term beach nourishment and sand management planning, this subgroup could collaborate with UNH researchers, NH Sea Grant, and NH Geological Survey on including Seabrook beach in the expanded beach profiling project. A targeted effort should be made to engage residents in conducting collaborative research who have not participated in past dune restoration efforts. This effort could begin as soon as funding becomes available for the next phase of the beach profiling project, which is anticipated for summer 2017. Depending on the timing, results from this research can inform the update of the beach management plan.

Participants in this subgroup could include interested representatives from the Seabrook Department of Public Works, the Seabrook Planning Board, the Seabrook Conservation Commission, the Seabrook Board of Selectmen, the Beach Village District Commission, the Seabrook Beach Civic Association, and the Seabrook Hampton Estuarine Alliance. The NH Coastal Program Federal Consistency Coordinator could liaise with state and federal agencies and provide advice about harbor dredging. If capacity allows, Rockingham Planning Commission and/or UNH could facilitate the meetings.

If Seabrook decides it wants the dredge material for beach nourishment, subgroup representatives from the Town and Beach Village District can collaborate with the Dredge Management Task Force on beach nourishment and planning for beach access restrictions. The

NH Coastal Program could convene this expanded group.

***Recommendation 3: Form a subgroup focused on a short-term plan to address gaps in scientific knowledge about beachgrass die-off, meet some outreach needs, and apply for funding to support these efforts.***

A subgroup could focus on initiating a citizen science initiative to engage residents in research to understand beachgrass die-off and strategies to address it. Participants could include Town and Beach Village District representatives, UNH researchers, and NH Coastal Program representatives. If funding is available, this initiative could be led by the “Human and Ecological Interactions in Dune Systems” project team and build on its ongoing research into beachgrass die-off. This subgroup could also apply for funding to support research, outreach, and education. The Town could hire a grant writer or, depending on capacity, UNH Researchers and/or Rockingham Planning Commission could take the lead on identifying and applying to funding opportunities.

***Recommendation 4: Reconvene the advisory group periodically to consider longer-term tasks of addressing connected dune and beach management issues together and responding to new challenges.***

If successful, the advisory group could reconvene periodically to consider longer-term objectives and a broader range of issues related to dune and beach management. Some of the possible longer-term goals raised during this SA are:

- Improving Seabrook’s storm readiness planning to increase flood protection for public safety and infrastructure and reduce vulnerability to flooding from storm surge and sea level rise,

including research into dune height and width necessary for protecting homes and infrastructure.

- Developing a post-storm recovery plan
- Reducing fire hazard and increasing awareness of public safety hazards in general
- Collaborating with other Village Districts and Seacoast communities
- Convening a shared visioning process for comprehensive, longer-term dune and beach planning
- Funding and maintaining harbor infrastructure for the fishing industry, including the pilings and docks
- Protecting salt marsh and salt marsh migration opportunities

### **3.7 Discussion**

This is not the town of Seabrook's first foray into addressing coastal resilience (See Section 1.1). They have participated in the New Hampshire Coastal Risks and Hazards Commission and worked with Rockingham County Planning Commission on the *Tides to Storms* report, which gave recommendations for adapting to coastal change, and assessed vulnerabilities within the town (NHCRHC, 2014; Rockingham Planning Commission, 2015). The planning board has recently added a Coastal Hazards and Adaptation chapter to the Seabrook Master Plan. The stakeholder assessment on the beach and dunes detailed here builds on recommendations in the *Tides to Storms* report to protect the Seabrook dunes, because they are important to protecting the vulnerable homes behind them from storm surge and sea level rise.

There is room for Seabrook to do more to protect their beach community. They have the regulatory basis to do so from the master plan chapter they just added. However, making regulatory changes now to address issues in the future is easier said than done. The process by



which regulations are written and enforced at the town and state level are reactive, not proactive. This was a common theme in interviews talking about resources for enforcement and the need for outreach. Changing state and local regulations to be more proactive to address coastal resilience issues is possible, but was beyond the scope of addressing beach and dune issues specifically. If the advisory group is successful in providing input for the updated beach management plan, perhaps they will be able to collaborate with each other and other local communities on longer-term resilience issues in a proactive manner.

### **3.8 Conclusion**

The Seabrook stakeholder assessment was conducted to address beach and dune issues and the tensions impacting beach and dune management. We assessed the willingness of stakeholders to collaborate around these issues, particularly those related to dune protection, wildlife and wildlife habitat protection, beach access and recreation, and harbor dredge sediment disposal. Determining this willingness required our assessment of how interdependent the stakeholders were around these issues and how interdependent they perceived themselves to be. In Chapter 4, I analyze the perceptions of stakeholder interdependence, before, during, and after the assessment to see if an SA can have an impact on fostering perceptions of interdependence.

## **Chapter 4**

### **Evaluation of the Impact of SAs on the Perception of Interdependence among Stakeholders**

According to the literature discussed in Chapter 2, stakeholders need to perceive their interdependence in order to be willing to collaborate. Chapter 2 also presented observations by ADR practitioners, which show examples of stakeholder assessments during which participants did increase their perceptions of SES and stakeholder interdependence by broadening the scope of issues they considered important and seeing the need to work with others on integrative solutions, respectively. However, neither the literature I reviewed, nor the practitioners with whom I spoke had analyzed the role of the stakeholder assessment in fostering perceptions of interdependence. In this chapter I analyze the impact of a stakeholder assessment on perceptions of interdependence. I investigate this question by surveying stakeholders who participated in the 2017 Seabrook, NH beach and dune management SA, described in Chapter 3, and analyzing their responses using qualitative and network analysis. First, I present the literature on the two components of interdependence, social ecological systems (SES) interdependence and stakeholder interdependence. Then, I present my research design and methodology, followed by the data and analysis.

#### **4.1 Literature Review**

According to the Alternative Dispute Resolution literature, in order for collaboration to be successful stakeholders need to recognize their interdependence (Gray, 1989; Logsdon, 1991). In order for stakeholders to be willing to collaborate, they have to recognize that working with other stakeholders is an appropriate way to address their interests. Interdependence in the context of collaboration is the need for parties to work with one another, because they cannot effectively

address their interests on their own. What underlies the need to work with one another is the connectedness of the issues that they care about, particularly when those issues are ecological in nature or driven by environmental factors (J.Fisher, 2014). However, perceptions of interdependence are not fixed and, instead, can change during a collaborative process (Innes & Booher, 2003; S. Selin & Chavez, 1995; Waayers et. al., 2012). What has not been addressed in the literature is if perceptions of interdependence can change before stakeholders engage directly with one another.

#### **4.1.1 *Role of SA***

Stakeholder assessment (SA), also known as conflict assessment, stakeholder analysis or situation assessment, is considered a necessary first step in a collaborative process (Bean et al., 2007; Grimble & Wellard, 1997; Reed S. et al., 2009; L. Susskind & Thomas-Larmer, 1999). The main purpose of SA is to determine if a collaborative process is likely to be successful, and, if so, to determine what steps would need to be taken in order for it to be successful. However, while there is quite a bit written on how and why SAs should be conducted, there has been little written on the impacts that the assessment can have on the stakeholders themselves (see Chapter 2 for this discussion).

#### **4.1.2 *Pre-Conditions for Collaboration***

Two pre-conditions are necessary in order for stakeholders to collaborate successfully. Stakeholders should have an interest in addressing the issue and they have to recognize they are interdependent with the other parties (Gray, 1989; Lodgson, 1991). Interdependence is defined here as the intertwining of stakeholder concerns and the need for multiple stakeholders’

involvement to solve a problem (Gray, 1989). Stakeholders can come to collaboration two ways: through either heightening the stakes of the issue and then perceiving higher interdependence or perceiving higher interdependence and then heightening the stakes (Lodgson, 1991). The other conditions for collaboration can be achieved only if these two conditions are met first. In environmental conflicts, there are two aspects of interdependence that are important to address: (1) social-ecological systems interdependence and (2) stakeholder interdependence (Gray, 1989; J.Fisher, 2014).

#### ***4.1.3 Social Ecological Systems (SES) Interdependence***

Social processes are deeply interconnected with ecological processes. People manage both human and ecological systems, while natural processes are important in shaping landscapes but also impact human activities and economies. Management decisions based on only ecological data or only social considerations miss the feedback loops inherent in these systems (Berkes, Colding, & Folke, 2003). SESs are complex systems characterized by non-linearity and unintended consequences and exist across different time and geographic scales (Liu et al., 2007). SES interdependence is the deep interconnection and the changes that reverberate within the entire system due to changes in one or more social or ecological processes.

The literature on SES adaptation and resilience is often framed through determining the likelihood of self-organization of human actors to manage their respective system (Ostrom, 2009). This is of direct importance when considering the factors leading to a successful collaboration. Ostrom (2009) lays out a framework and a collection of independent variables that affect this likelihood of self-organization. One factor is knowledge of SES models, indicating that the more the actors understand the SES, the more likely they are to self-organize to manage

it (Ostrom, 2009). Understanding this intertwining of issues is essential to adapting to and becoming resilient to system changes (Folke, 2007). However, many of the other variables Ostrom (2009) outlines simply characterize the SES, and therefore are not necessarily applicable to recognizing SES interdependence.

Table 4.1. How components of SES Interdependence are recognized.

<b>Component of SES Interdependence</b>	<b>How it is recognized</b>
Complexity (Brondizio, Ostrom, & Young, 2009)	Abundance of interacting units and systems
Nestedness or differences in scale (Brondizio et al., 2009)	Presence and number of sub-systems
Connectivity (Brondizio et al., 2009)	Connections between all sub-systems and systems
Feedback within social system (Berkes et al., 2003)	Connections between social sub-systems
Feedback within ecological system (Berkes et al., 2003)	Connections between ecological sub-systems

There are a number of ways SES interdependence manifests and is recognized within a system (Table 4.1). Social and ecological components are connected among sub-units of the system and there are feedback loops present within social systems, ecological systems, and between sub-components of the entire coupled SES (Berkes et al., 2003; Brondizio et al., 2009). This connectivity also exists at different scales (Brondizio et al., 2009). For example, in a coastal system on a regional scale, there might be a connection between human development and a change in beach barrier island movement. On a local scale, that connection may exist between a wall and the inability of sand to be able to move beyond the wall. SES interdependence should therefore be recognizable by stakeholders when they acknowledge interactions of issues that influence the system of concern. Recognizing interactions between social and ecological components should potentially make stakeholders more willing to collaborate (Ostrom, 2009).

#### **4.1.4 Stakeholder Interdependence**

Stakeholder interdependence captures the need for individuals to work together in order to meet their interests and their recognition that their independent actions impact one another through complex social and ecological feedback loops (Innes & Booher, 2003; Gray, 1989; Innes & Booher, 2003). If individual stakeholders can achieve their desired outcomes through unilateral action, then negotiation is unnecessary and, therefore, a collaborative approach is not needed (Innes & Booher, 2003). Even if this is not the case, when stakeholders do not perceive their interdependence, they have little motivation to collaborate (Logsdon, 1991). Renewed or heightened appreciation of interdependence can jumpstart willingness to work through differences for a “mutually beneficial solution” (Gray, 1989). The more stakeholders perceive the need to work with others, the more willing they will be to collaborate (Innes & Booher, 2003).

According to Gray (1989), an essential first step in collaboration is raising the awareness of stakeholders to consider how their interests are interconnected and why they might only be able to solve the problem together. In many cases, it is because of the intertwined nature of the problem that stakeholders come together. For example, Sobel (2000) was asked to facilitate a collaborative process on Martha’s Vineyard shoreline restoration due to overlapping jurisdictions and the responsibilities of different parties for systems affecting each other, in this case, the beach and adjacent road. The shoreline-road system was an example of an SES, and erosion on the beach and the deterioration of the road could not be fixed by one party’s actions. The stakeholders understood the linkages in the system and their reliance on one another to manage the system would require collaboration. In another example, a small ecotourism- based community looked to protect their sea turtles from increased development due to tourism. The stakeholders’ recognition of the complexity and intertwining of tourism and conservation issues,

and their need to work together to manage those issues, catalyzed their collaboration (Waayers et al., 2012).

Awareness of interdependence starts to form as stakeholders define and identify their own interests and understanding of the problem (Innes & Booher, 2003; S. Selin & Chavez, 1995). Joint formulation of aims and objectives can take away a sense of mistrust as well as foster a feeling of interdependence; by defining the problem together it can bring about the feeling that it must be solved together (Waayers et al., 2012). As awareness of interdependence is developed, relationships are built up that become the foundation for problem solving (Innes & Booher, 2003). According to these sources, fostering feelings of interdependence is important in the process moving forward, but they only address how this might be addressed once the process has begun.

While it is considered a pre-condition to successful collaboration, the literature considers fostering recognition of interdependence only once the stakeholders have come together and engage in dialogue, not at the start of the collaborative process (Forester, 1999; Innes & Booher, 2003). Poitras & Bowen (2001) delve into the conditions necessary to initiate a process, and without an impetus to collaborate, which recognition of interdependence can contribute towards, parties don't feel the need to participate in the process. Where a collaborative approach might yield effective problem-solving, fostering recognition of interdependence in the first step of the process could lead to more successful collaborations.

#### **4.2 Research Design and Methodology**

#### **4.2.1 Research Question**

Does participating in an SA change stakeholders' perception of interdependence?

- 1) Does participating in an SA change stakeholders' perceptions of SES interdependence?
- 2) Does participating in an SA change stakeholders' perceptions of stakeholder interdependence?

#### **4.2.2 Research Design**

This research analyzes the impact of a dune and beach management SA in Seabrook, NH on stakeholders' perceptions of interdependence. A mixed- method approach was used, which included paired surveys before and after the assessment, as well as in-person interviews that were conducted as part of the assessment. For a description of the interview methods, please see Section 3.1 Project Overview.

##### *Survey Methods*

Each SA participant was asked to complete a survey at the start of the SA to establish a baseline of how he or she perceived both stakeholder and SES interdependence in Seabrook, and again at the end of the SA to compare their responses. Please see Section 3.1 Project Overview for a description of the SA participant population. Both the pre- and post-surveys were conducted electronically, using Qualtrics survey software. Both surveys asked the same open-ended questions, with the exception of one question in the pre-survey, which focused on additional comments, and one in the post-survey focused on feedback on the draft SA report. The survey questions and format were tested with three respondents and revised based on their feedback. The pre and post-surveys were sent to all 30 SA participants identified using a snowball approach (for more detail on how these participants were identified please see Section 3.1). Twenty-eight out of the 30 completed the pre-survey for a 93% response rate. Twenty-six



completed both the pre-survey and participated in a semi-structured interview as part of the stakeholder assessment. Ten completed both the pre-survey and post-survey for a 33% response rate. Please see Figure 4.1 for data showing the distribution of stakeholder groups for the responses. All pre-surveys were completed between October 2016 and May 2017 in advance of semi-structured interviews that were part of the SA. Participants were told only that the survey answers would help guide the interview, so as to avoid priming them to think about interdependence. All post-surveys were completed after semi-structured interviews and two workshops were held with stakeholders. The post-survey was sent electronically along with the draft SA report in June 2017. Ten SA participants responded to the pre- and post-survey, out of which eight had also participated in the interviews.

Data on a stakeholder's perception of SES interdependence were collected by asking each survey respondent to identify up to 10 issues that impact dune and beach management in Seabrook and then to identify which of these issues impact one another (See Appendix E for sample survey). Twenty-one participants answered the SES set of questions in the pre-survey and 10 answered them in the post-survey. However, responses could be used from only the seven respondents who provided answers to these questions in both the pre- and post-surveys. Only survey data regarding the issues related to dune and beach management were used to examine changes in perceptions of SES interdependence. Interview data were not used because, while the SA was coded to identify issues, each connection between those issues was not coded and, therefore, could not be used to assess SES interdependence.

Data on a stakeholder's perception of stakeholder interdependence were collected by asking each survey respondent to identify up to six groups or organizations with whom they would need to work to address the issues they had identified earlier and to rate how important it

would be to work with the group. Twenty-eight participants answered the stakeholder set of questions in the pre-survey and eight answered these questions in the post-survey. Data on identified stakeholders were also coded in the 28 interview transcripts because interviewees were explicitly asked about with whom they thought it was important to work.

*Survey Data Analysis Methods*

A social network analysis approach was used to analyze the survey data. Network analysis is an appropriate method to analyze and visualize the relationships characteristic of complex SES systems, in which actors are inherently interdependent and not independent in a system (Borgatti, Everett, & Johnson, 2013), and is increasingly cited as an analytic method for use in SAs (Kivits, 2011; Lienert, et al., 2013; Reed et al., 2009). Excel, Ucinet 6 (S.P. Borgatti, Everett, & Freeman, 2002), and NetDraw (Borgatti, 2002) software were used.

Table 4.2. Data used for each method of analysis to measure stakeholder and SES interdependence among participants in Seabrook, NH SA.

	<b>Analysis</b>	<b>Data Used</b>
<b>Stakeholder Interdependence</b>	Individual Change	Pre- and Post-Survey
	Subset and Subset Aggregate Network Analyses	Pre- Survey, Interview, and Post-Survey
	Full, and Participant Network Analyses	Pre- Survey, Interview, and Post-Survey
<b>SES Interdependence</b>	Individual Change	Pre- and Post-Survey
	Individual Network Analysis	Pre- and Post-Survey
	Combined Network Analysis	Pre- and Post-Survey

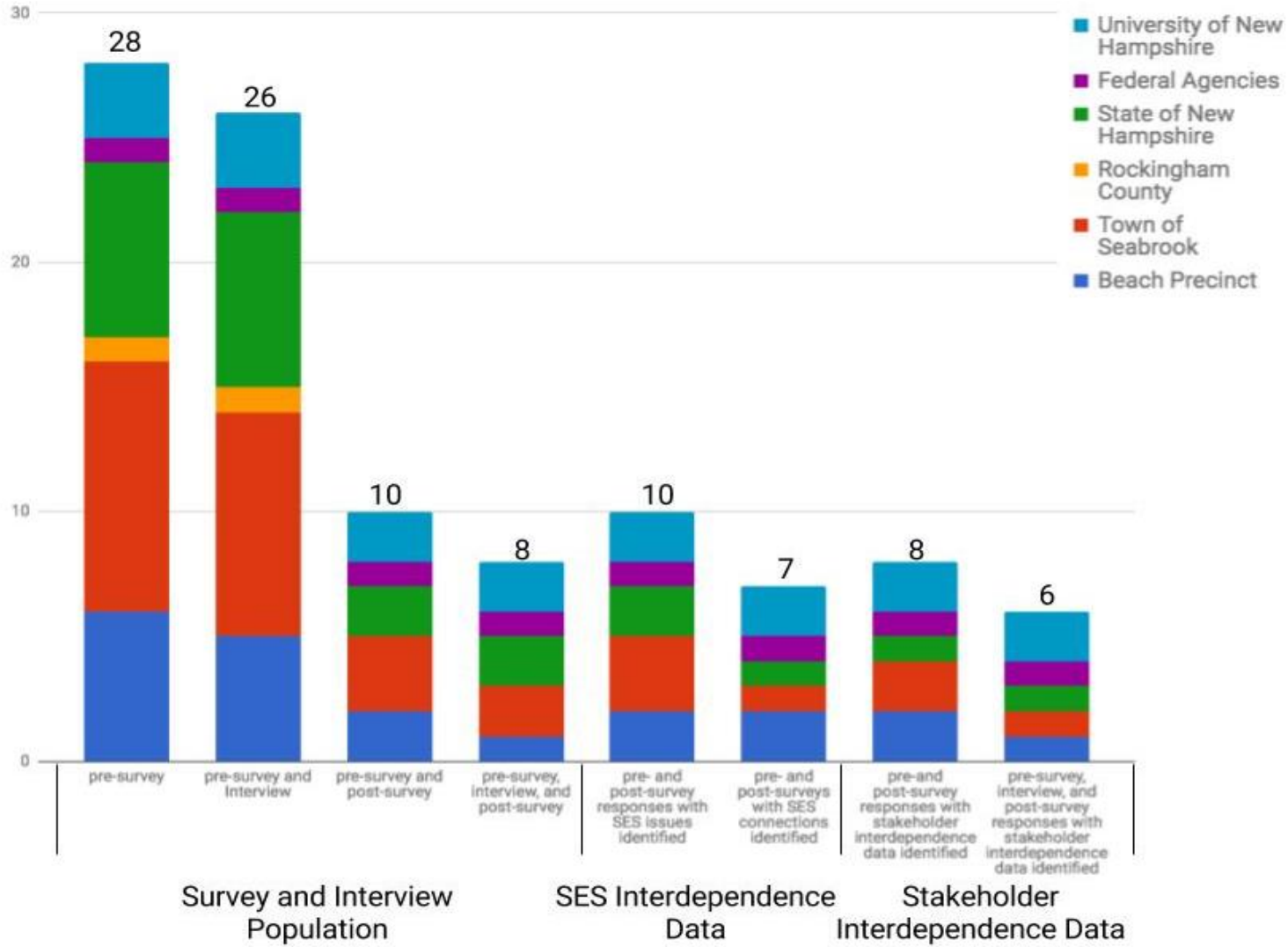


Figure 4.1. Stacked bar chart characterizing responses by stakeholder group. Data provided only for those used in the analyses outlined in Table 4.2.

### *Stakeholder Interdependence Analysis*

Stakeholder interdependence was analyzed by comparing paired individual responses of the eight participants who completed both surveys with responses in the stakeholder sections (Table 4.2). Each available participant response to the pre- and post- survey was paired to analyze for individual changes in perception of interdependence. For the individual qualitative analysis survey data were not edited, but left with respondents' original wording intact to be able to compare the language used before and after the assessment. Responses were analyzed to determine if any stakeholders or stakeholder groups were identified in both the pre- and post-survey. The total number of discrete stakeholders identified in the pre- and post-survey together was counted, as well as the number of stakeholders identified in each survey. Percent change in discrete identified stakeholders was calculated.

While the paired responses could show changes in how individuals perceived their need to work with one another, the individual qualitative analysis does not capture how stakeholder groups perceive one another as a whole. In order to analyze this aspect of stakeholder interdependence, a network analysis was necessary. Survey and interview data were organized into stakeholder groupings with similar interests and priorities, which had been previously identified as part of the SA (see Figure 3.1). The open-ended survey data were normalized, i.e. 'beach precinct', 'beach commissioners', 'beach commission', and 'beach village district', were all relabeled as 'beach commission' so the network analysis could function properly. Interview data from the SA were coded to identify with whom participants had mentioned as important to work. Both survey and interview data were aggregated by organization so that, for example, the responses from the three individuals from 'UNH' were aggregated to create one set of issues and stakeholders to work with from 'UNH'. In Excel, three matrices, representing the pre-survey,

interview, and post-survey data, were compiled of the set of stakeholders. Subsets of these matrices were also created which include only the six respondents who completed the stakeholder sections of the two surveys and participated in the interview process. This allowed for comparison across the three treatments: pre-survey, interview, and post-survey.

These matrices were entered into Ucinet and manipulated with NetDraw. With NetDraw, the subset data of six respondents who had participated in all three treatments were visualized in two ways: the *subset network* of six respondents and the stakeholders they identified, and the *subset aggregate network* of respondents grouped into their categories, i.e., ‘NH Fish and Game’, ‘Natural Heritage Bureau’, and ‘NHDES Wetlands Bureau’ all collapsed into the stakeholder group, ‘State’ (Table 4.2). The full dataset was visualized for each matrix in two ways: the *full network* with all respondents and the stakeholders they identified, and the *participant network* of only the interactions between participants in the SA (Table 4.2). For each visualized network, reciprocal ties, i.e., when stakeholder organizations or aggregate stakeholder groups had identified one another, were highlighted in blue. These networks were analyzed in Ucinet for multiple cohesion measures, including average degree, arc reciprocity, and network density. Average degree is the average measure of how many connections are made to each node in the network. Arc reciprocity measures the percentage of ties that are reciprocal. Density is a measure of the proportion of actual ties to possible ties (Borgatti, et. al., 2013). Using these metrics a clear comparison across the datasets can be made. If participating in an SA increases participants’ perception of stakeholder interdependence, the individual post-survey responses should identify more stakeholders, as compared to their pre-survey responses. The aggregate of those responses should also show an increase in connections made between stakeholders and reciprocal ties between stakeholders.

### *SES Interdependence Analysis*

Responses were coded to normalize the issues identified across paired surveys and among all respondents. Matrices were developed to compare each individual's pre- and post-survey responses. Combined matrices of all seven respondents' pre and post survey issues were also developed to examine how the aggregated group perceived SES interdependence. Matrices were analyzed and visualized with Ucinet and NetDraw. Reciprocal ties in the networks were highlighted in blue in order to show where stakeholders directly identified one another as important to work with. These networks were analyzed for multiple cohesion measures, including number of issues, transitivity, arc reciprocity, connectedness and network density (Table 4.3). Transitivity measures the proportion of sets of three nodes connected by two ties for which there is a third tie closing the set. Transitivity is useful in looking at perception of SES interdependence because it expresses the smaller patterns of impacts people perceive in the system. Connectedness measures how difficult it is to break a network apart; it is the inverse of the fragmentation metric. These metrics were compared for both each individual's pre- and post-survey responses, as well as the aggregate group's pre- and post-survey responses.

Table 4.3. Network analysis metrics to measure SES Interdependence components.

<b>SES Interdependence Component</b>	<b>Network Analysis Metrics</b>
Complexity	Number of Issues, Density
Feedback	Arc Reciprocity, Transitivity
Connectivity	Connectedness

The paired pre- and post-survey responses from each of the 10 individuals were analyzed to identify perceived changes in the issues related to dune and beach management (Table 4.2). For this analysis, participants' wording was not edited in order to compare language usage before and after the assessment. Responses were analyzed to identify issues identified in both the pre-

and post-surveys. The total number of different issues identified across both the pre- and post-surveys was counted, as was the number of issues identified in each survey. Percent change in identified issues was calculated to show the change in discrete issues respondents perceived important for dune and beach management. If participating in an SA increases participants' perception of SES interdependence, their post-survey responses will show more connections between identified issues and more identified issues, as compared to their pre-survey responses.

### **4.3 Data**

#### **4.3.1 *Stakeholder Interdependence***

##### *Analysis of individual stakeholders*

Eight participants provided functional data to examine changes in stakeholder interdependence before and after participation in the assessment (Table 4.4). Four identified a greater number of stakeholder groups with whom it would be important to work in the post-survey, three identified the same number of groups, and one identified fewer groups. However, the groups each individual identified were often not the same exact groups they identified in the pre-survey. In the post-survey, most respondents changed the specificity of their identification of stakeholder groups. For example, one respondent identified 'state agencies' in the pre-survey, but the more specific 'NH Coastal Program' in the post-survey. Other respondents became less specific.

The actual groups identified also changed. Every respondent identified at least one new group in the post-survey they had not identified in the pre-survey. Half of the respondents changed more than 50% of the stakeholders they identified across the pre- and post-surveys. Some responses appeared to reflect language from the SA report. For example, one new post-SA

response identified a research group mentioned in the SA report. Another respondent changed the name by which they referred to a stakeholder group in their post-survey response to correspond to the language used in the SA report.



Table 4.4. Quantitative and qualitative changes in stakeholder groups identified by eight individuals who participated in pre- and post-survey.

<b>Response code</b>	<b>Total # of discrete stakeholders identified in both surveys</b>	<b># of stakeholders identified in the Pre-survey</b>	<b># of stakeholders identified in the Post-survey</b>	<b>Change in # of stakeholders identified from the Pre- to the Post-survey</b>	<b>% Change of discrete stakeholders identified from the Pre- to the Post-survey</b>	<b>Descriptive changes from the pre- to the post- survey</b>
SS 29	7	4	4	0	0.71	more specific, groups/ projects mentioned in report
SS 01	7	5	6	1	0.43	same specificity, recognize that environmental non-profits aren't part of Seabrook beach landscape
SS 30	5	3	4	1	0.60	more specific, recognize civic association, and agencies where land use policy regulators may be housed
SS 12	4	1	3	2	1.00	less specific, break down by how organized in the report
SS 02	7	6	5	-1	0.43	less specific, more specific at town level
SS 22	9	3	7	4	0.89	same specificity, recognizes players as they are listed in the report
SS 06	6	5	5	0	0.33	same specificity, little change, recognize UNH role, lost role of beach residents
SS 19	7	6	6	0	0.14	more specific, before just had the category, now the specific group that functions in that category

### *Subset Network Analysis*

Six respondents completed the stakeholder sections of the two surveys and participated in the interview process. Their data were used to more accurately compare the three datasets (Table 4.5). By using the same set of respondents, discrete changes in the perceived network of stakeholders can be identified. While both survey networks had more nodes than in the interview network, the interview network was more connected than either survey network. The average degree and density from the interview data were higher than in both the pre- and post-survey data networks, and the interview data showed some reciprocity. The average degree and density from the post-survey were higher than in the pre-survey, but neither network had any reciprocity. The small increase in interconnectedness from the pre- to the post- survey supports the idea that participating in an SA can increase perceptions of stakeholder interdependence. However, the inclusion of the interview data indicates more interdependence is perceived during the assessment than before or after.

Table 4.5. Number of nodes, number of ties, average degree, density, and arc reciprocity for the networks constructed from the six respondents who participated in the stakeholder sections of the pre- survey, interviews, and post-survey.

<b><i>Subset Network</i></b>	<b>Pre-Survey</b>	<b>Interview Data</b>	<b>Post-Survey</b>
<b>Nodes</b>	22	14	20
<b>Ties</b>	26	26	28
<b>Avg. Degree</b>	1.182	1.857	1.400
<b>Density</b>	0.056	0.143	0.074
<b>Arc Reciprocity</b>	0	0.154	0

Analyzing the aggregate network of the subset dataset allows for conclusions to be drawn about how stakeholders view the need to work with categories of groups. For example, someone from the ‘Beach’, recognizing generally that they need to work with someone from the ‘State’. Comparison of aggregate networks across the three treatments (Table 4.6) show there is not too much difference in how stakeholder groups perceive the need to work with one another.

However, again the interview data is more interconnected than the pre- or post-survey data, as shown from the metrics of average degree and density. Changes in measures of interconnectedness from the pre- to the post- survey are not as clear, with little change in the average degree and the density. There are, however, more reciprocal connections in the post-survey than in either the pre-survey or the interview data, indicating more stakeholder groups recognize the need to work with one another.

Table 4.6. Number of nodes, number of ties, average degree, density, and arc reciprocity for the aggregate networks constructed from the six respondents who participated in the stakeholder sections of the pre- survey, interviews, and post-survey.

<b><i>Subset Aggregate Network</i></b>	<b>Pre-Survey</b>	<b>Interview Data</b>	<b>Post-Survey</b>
<b>Nodes</b>	7	6	8
<b>Ties</b>	13	12	12
<b>Avg. Degree</b>	2.286	2.667	2.375
<b>Density</b>	0.381	0.533	0.339
<b>Arc Reciprocity</b>	0.375	0.500	0.632

*Full and Participant Network Analysis*

The larger network analysis showed the interview data in a more robust and connected network of stakeholders than either the pre- or post- survey data. Average degree, density, and arc reciprocity all had higher values for the interview data in both the full network and the participant network compared to the networks constructed from both sets of survey data (Tables 4.7 and 4.8). In the interview network there were more connections per node, a higher density of ties across the network, and a higher proportion of reciprocal ties.

Table 4.7. Number of nodes, number of ties, average degree, density, and arc reciprocity of the full network of stakeholders identified in paired surveys and interview data.

<b>Full Network</b>	<b>Pre-Survey</b>	<b>Interview Data</b>	<b>Post-Survey</b>
<b>Nodes</b>	51	30	23
<b>Ties</b>	96	108	42
<b>Avg. Degree</b>	1.882	3.600	1.783
<b>Density</b>	0.038	0.124	0.081
<b>Arc Reciprocity</b>	0.083	0.361	0.098

*Note.* Figures 4.2-4.4 are visualizations of the full networks.

Table 4.8. Number of nodes, number of ties, average degree, density, and arc reciprocity of the network of participating stakeholders identified in paired surveys and interview data.

<b>Participant Network</b>	<b>Pre-Survey</b>	<b>Interview Data</b>	<b>Post-Survey</b>
<b>Nodes</b>	17	19	12
<b>Ties</b>	36	83	22
<b>Avg. Degree</b>	0.706	4.368	2.118
<b>Density</b>	0.014	0.243	0.132
<b>Arc Reciprocity</b>	0.222	0.458	0.222

*Note.* Figure 4.5 -4.7 are visualizations of the participant networks.

In examining the details of the full (Figures 4.2-4.4) and participant networks (Figures 4.5-4.7), a few things stand out. One is that those stakeholders identified in the interview data and post-survey much more closely reflects who is participating in the assessment than those who were identified in the pre-survey. The full pre-survey network has many more nodes than either the interview or post-survey networks, possibly indicating stakeholders became more aware over the course of the assessment who were the important parties. Another important point is found in looking closely at the reciprocal ties. Across all of the constructed full and participant networks, two stakeholders have reciprocal connections in each instance: ‘Town Manager and Selectmen’ and ‘Beach Commission’. There is recognition across a number of stakeholders that these two parties are important to work with. They also are reciprocally connected with one another in each network.

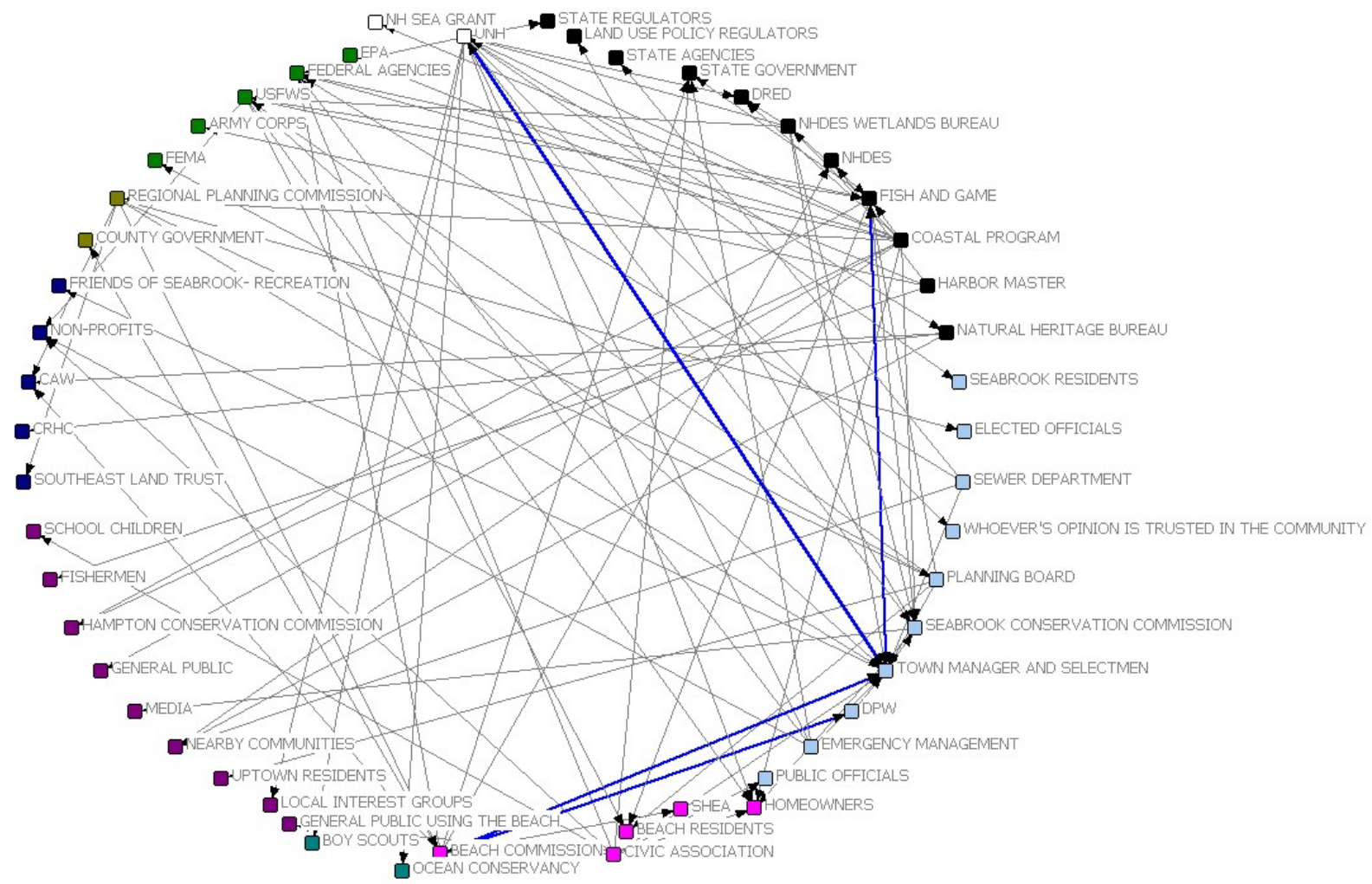


Figure 4.2. Full network of all participating organizations and all stakeholder and stakeholder groups identified in the pre-survey. Blue lines indicate reciprocity. Node colors represent larger stakeholder groupings. Refer to metrics in Table 4.7.

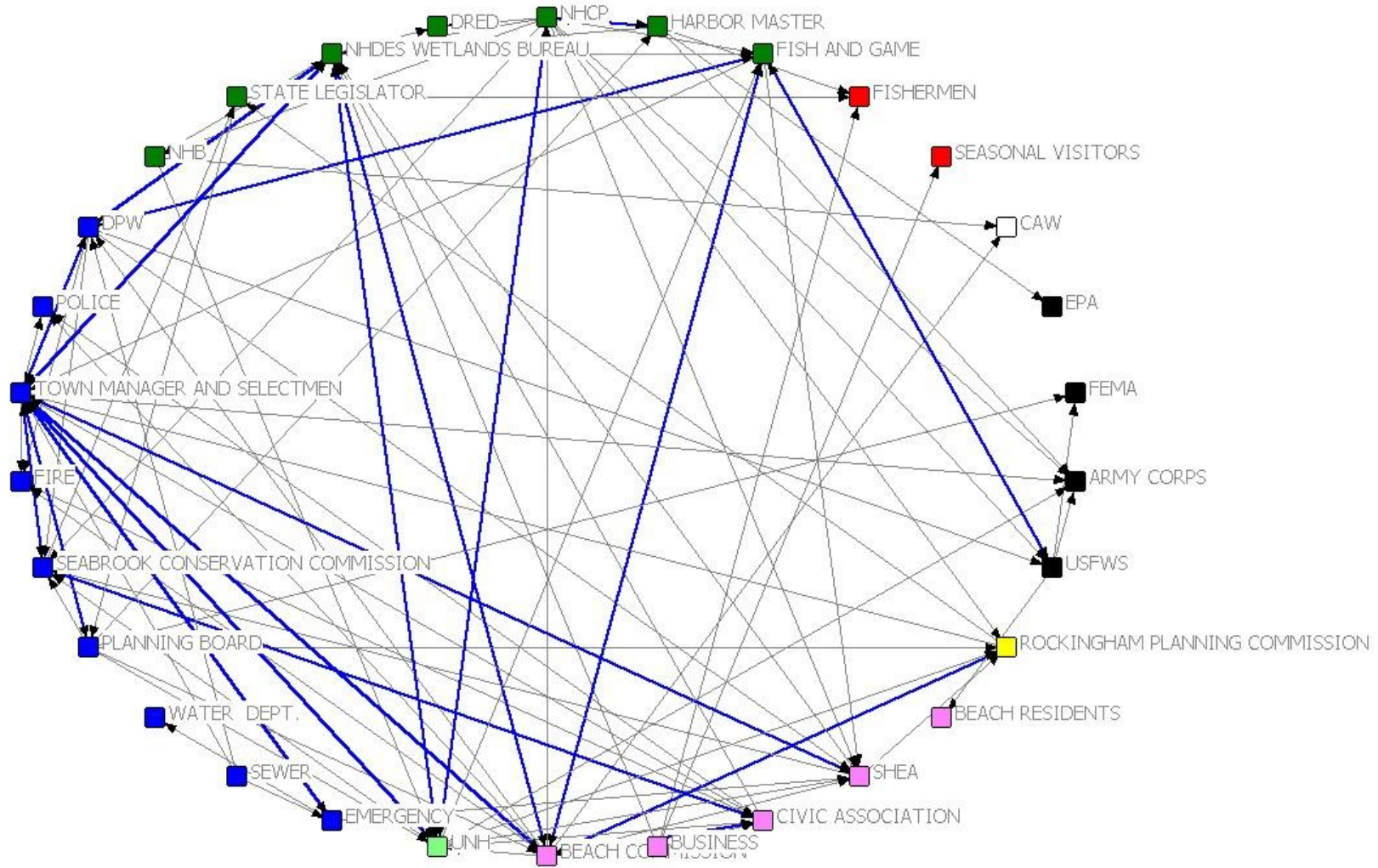


Figure 4.3. Full network of all participating organizations and all stakeholder and stakeholder groups identified from the assessment interview data. Blue lines indicate reciprocity. Node colors represent larger stakeholder groupings. Refer to metrics in Table 4.7.

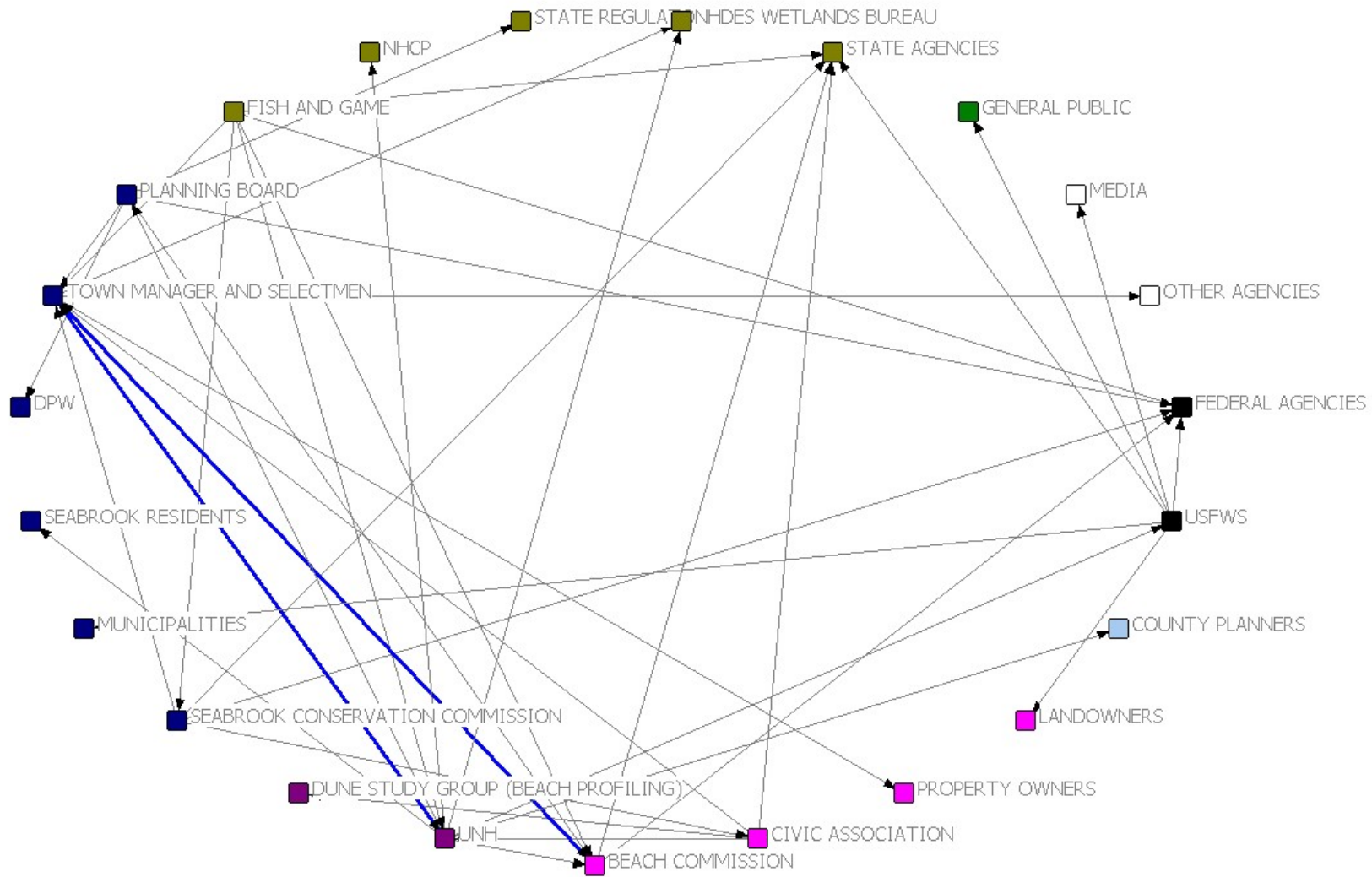


Figure 4.4. Full network of all participating organizations and all stakeholder and stakeholder groups identified from the post-survey data. Blue lines indicate reciprocity. Node colors represent larger stakeholder groupings. Refer to metrics in Table 4.7.

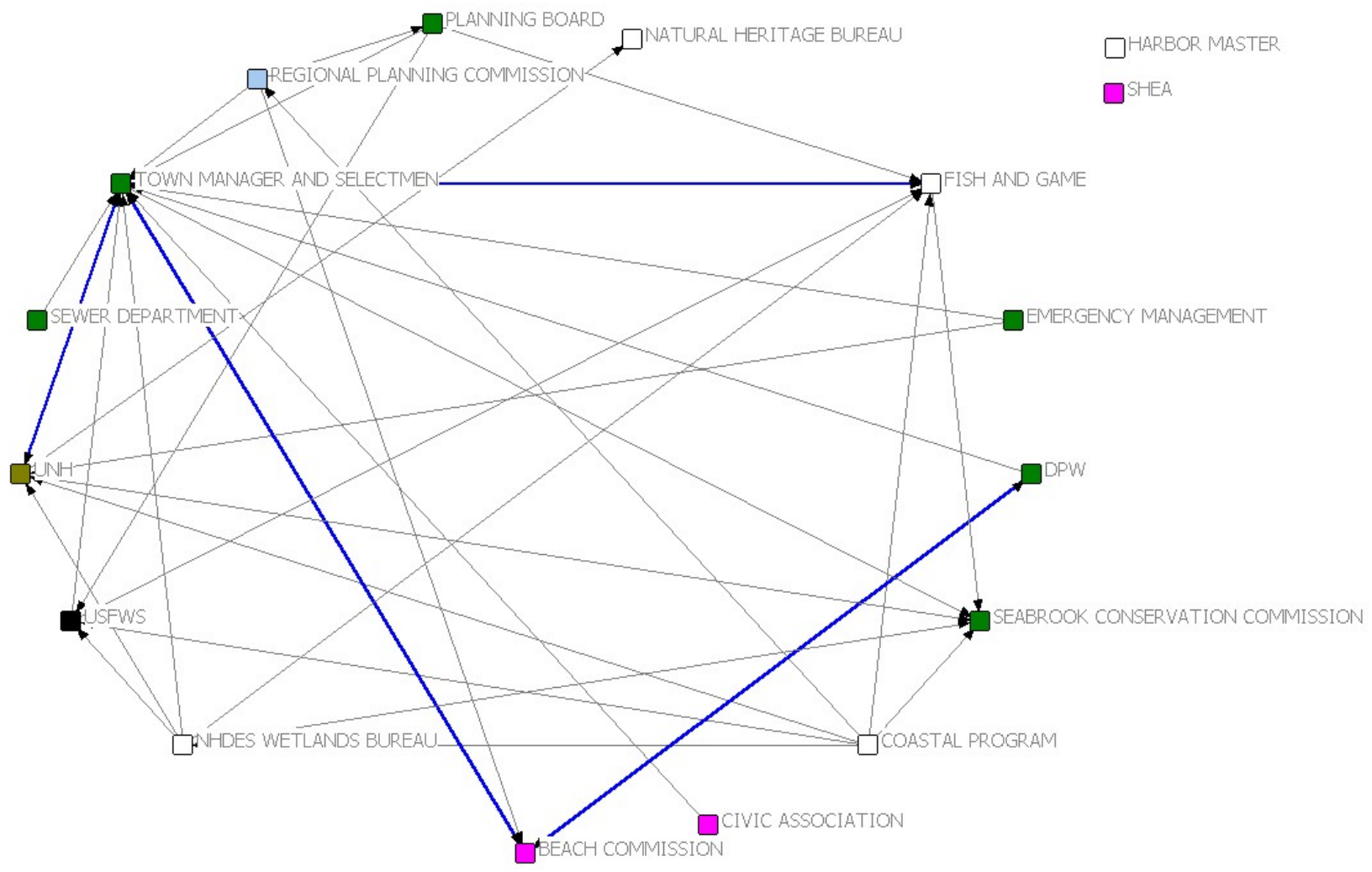


Figure 4.5. Pre-survey network subset of only those organizations that participated in the SA. Blue lines indicate reciprocity. Node colors represent larger stakeholder groupings. Refer to metrics in Table 4.8.



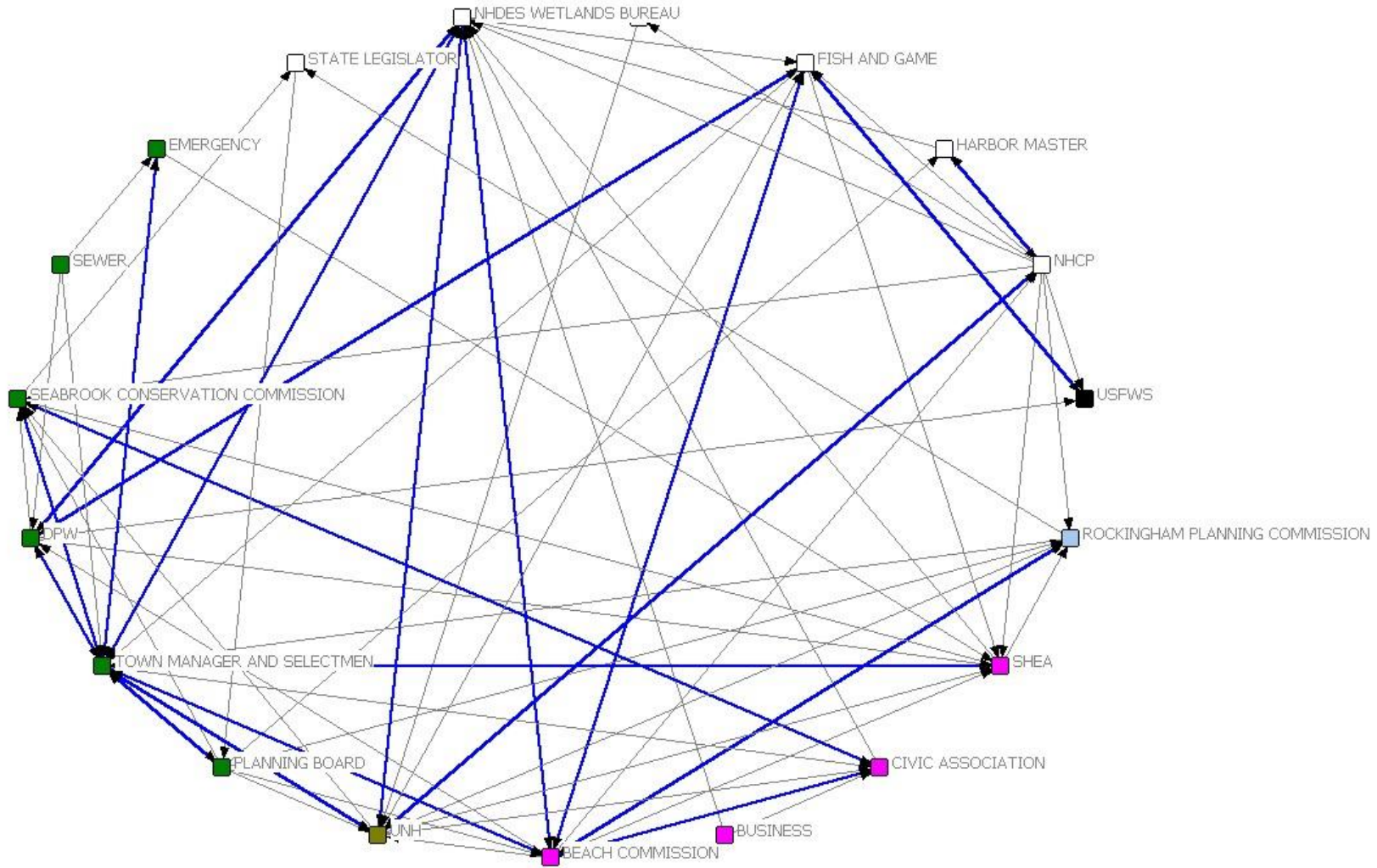


Figure 4.6. Interview network subset of only those organizations that participated in the SA. Blue lines indicate reciprocity. Node colors represent larger stakeholder groupings. Refer to metrics in Table 4.8.

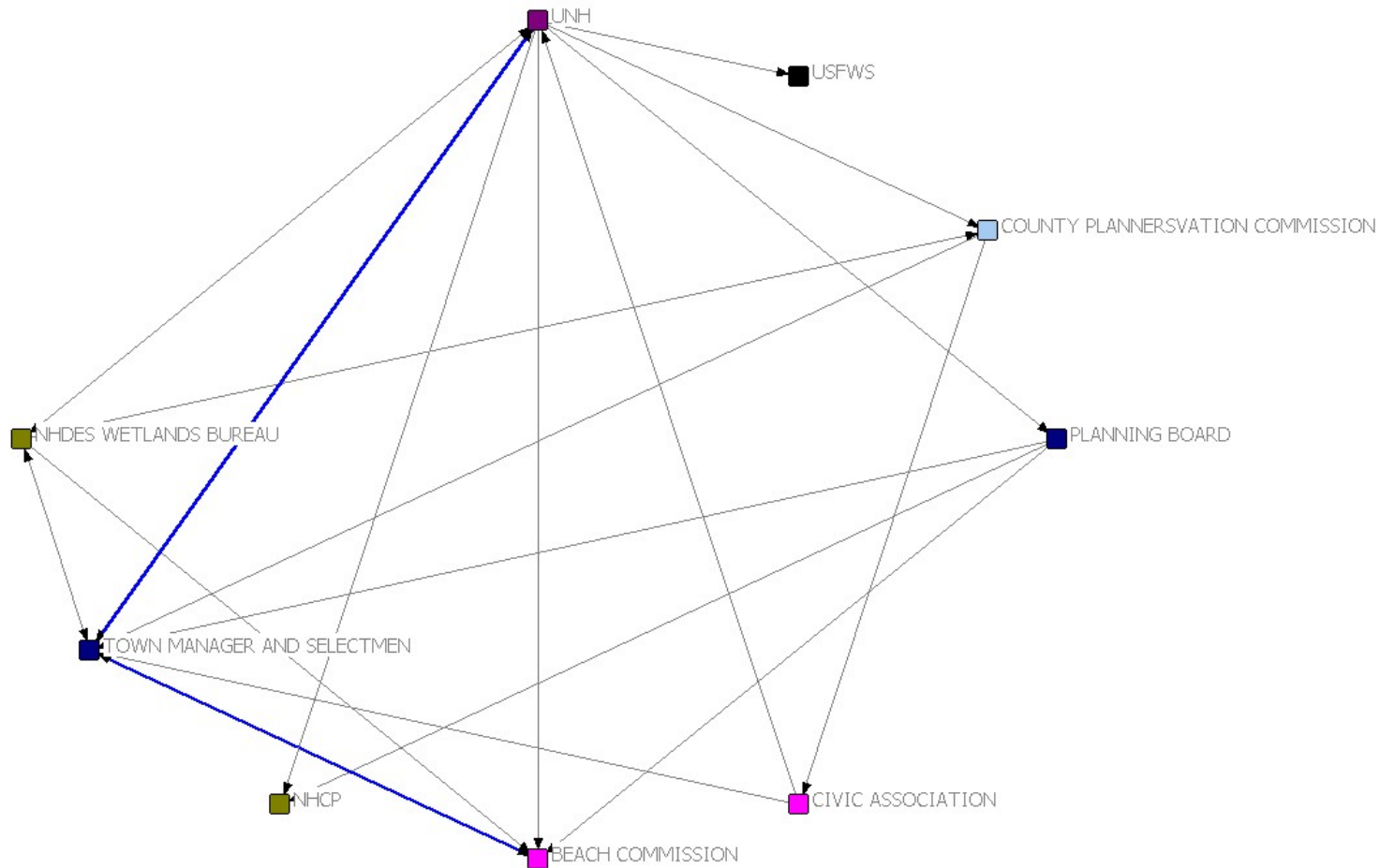


Figure 4.7. Post-survey network subset of only those organizations that participated in the SA. Blue lines indicate reciprocity. Node colors represent larger stakeholder groupings. Refer to metrics in Table 4.8.

### **4.3.2 SES Interdependence**

#### *Analysis of individual stakeholders*

Ten participants who completed both surveys reported issues that impacted beach and dune management (Table 4.9). The average number of issues from the pre-survey and the post-survey were 4.5 and 5.4, respectively, indicating a small increase in how stakeholders perceived the issues. Five participants reported the same or fewer issues and five reported more issues. Similar to the analysis of stakeholder interdependence, many participants changed the discrete issues they identified across the two surveys. Only one participant characterized the important issues in the same way the second time. All other participants showed a change in over half of all of the issues they identified. On average, there was a discrete change of 58% of issues identified.

In the post-survey, some respondents focused on the same set of issues they described in the pre-survey, but added one or two issues to broaden the scope of how they characterized the system. Other respondents entirely changed the issues they identified as important across the two surveys. For example, in the pre-survey one respondent characterized the issues at Seabrook Beach in terms of the attitudes and knowledge of the public and Town regarding the coastal system (e.g. ‘failure of public to be concerned about what may happen decades in the future’). In the post-survey, this same respondent identified issues related to recreational activities the public engages in at the beach (e.g. ‘dogs off leash at the beach’ and ‘fireworks and bonfires in the dune areas’).

Table 4.9. Quantitative and qualitative changes in issues identified by 10 individuals who participated in pre and post survey.

Response code	Total # of discrete stakeholders identified in both surveys	# of stakeholders identified in the Pre-survey	# of stakeholders identified in the Post-survey	Change in # of stakeholders identified from the Pre- to the Post- survey	% Change of discrete stakeholders identified from the Pre- to the Post-survey	Descriptive changes from the pre- to the post- survey
SS 19	10	7	7	0	0.60	less complex answers, more issues as they are found in the assessment, i.e. research needs, and regulation enforcement
SS 30	10	6	10	4	0.50	same issues plus the private pathways and invasives on the dunes- seem to get that out of the assessment
SS 25	3	3	3	0	0.00	Same set of issues regarding harbor maintenance
SS 13	2	1	2	1	0.50	same issue of residential encroachment, but the second set of issues included other human activity on the dunes
SS 12	7	5	4	-1	0.57	Second set of issues focused on visitors and residents actions in the dunes, not the enforcement or issues of how the town engages with the dunes
SS 02	7	5	3	-2	0.71	less specific issues, previous set of issues encompassed by 'inappropriate use'; addition of dieoff as an issue
SS 06	7	5	4	-1	0.57	similar set of issues, but did not include reduction in wildlife habitat
SS 01	9	4	9	5	0.67	similar set of issues, but added invasive species and garbage
SS 29	11	6	7	1	0.82	previous set of issues focused on attitudes and awareness of the public; second set of issues focused on specific actions on the beach that reflect what was written about in the report
SS 22	7	3	5	2	0.86	previous set of issues focus on access and recreation opportunities at the beach; second set of issues focus more on development and storm protection

*Analysis of individual networks*

Seven individuals indicated connections between issues impacting dune and beach management in both pre- and post-surveys. Tables 4.10 and 4.11 outline the characteristics of the networks of issues of each of these seven individuals. Overall there was a slight increase in the density of the networks that participants described in the post-survey and a slight increase in arc reciprocity. Reciprocity increased for three individuals, even one who indicated one less issue as compared to the pre-survey. Three of the four individuals who identified more issues in their post-survey network also showed a higher density in those networks. There was an average negative change in transitivity, indicating participants identified fewer small feedback loops of issues in the post survey.

Table 4.10. Number of issues, density, arc reciprocity, and transitivity of the seven paired individual networks of issues impacting dune and beach management.

<b>Response Code</b>	<b>Pre Survey Metrics</b>	<b>Pre Survey Values</b>	<b>Post Survey Metrics</b>	<b>Post Survey Values</b>
SS 01	<b># of Issues</b>	4	<b># of Issues</b>	10
	<b>Density</b>	0.333	<b>Density</b>	0.367
	<b>Reciprocity</b>	0	<b>Reciprocity</b>	0.485
	<b>Transitivity</b>	0.500	<b>Transitivity</b>	0.553
SS 06	<b># of Issues</b>	5	<b># of Issues</b>	4
	<b>Density</b>	0.450	<b>Density</b>	0.500
	<b>Reciprocity</b>	0.667	<b>Reciprocity</b>	0.667
	<b>Transitivity</b>	0.800	<b>Transitivity</b>	0.500
SS 12	<b># of Issues</b>	5	<b># of Issues</b>	4
	<b>Density</b>	0.750	<b>Density</b>	0.500
	<b>Reciprocity</b>	0.667	<b>Reciprocity</b>	1
	<b>Transitivity</b>	0.935	<b>Transitivity</b>	0
SS 19	<b># of Issues</b>	8	<b># of Issues</b>	7
	<b>Density</b>	0.750	<b>Density</b>	0.810
	<b>Reciprocity</b>	1	<b>Reciprocity</b>	0.941
	<b>Transitivity</b>	0.891	<b>Transitivity</b>	0.829
SS 22	<b># of Issues</b>	3	<b># of Issues</b>	5
	<b>Density</b>	0.167	<b>Density</b>	0.350
	<b>Reciprocity</b>	0	<b>Reciprocity</b>	0.571
	<b>Transitivity</b>	0	<b>Transitivity</b>	0.429
SS 29	<b># of Issues</b>	6	<b># of Issues</b>	7
	<b>Density</b>	0.667	<b>Density</b>	0.476
	<b>Reciprocity</b>	0.800	<b>Reciprocity</b>	0.700
	<b>Transitivity</b>	0.712	<b>Transitivity</b>	0.627
SS 30	<b># of Issues</b>	6	<b># of Issues</b>	10
	<b>Density</b>	0.100	<b>Density</b>	0.367
	<b>Reciprocity</b>	0.667	<b>Reciprocity</b>	0.667
	<b>Transitivity</b>	0	<b>Transitivity</b>	0.485

Table 4.11. Difference from pre- to post survey of number of issues, density, arc reciprocity, and transitivity for each individual’s network of issues impacting dune and beach management.

SS 01	<b>Change in # of Issues</b>	6	<b>Change in Density</b>	0.034	<b>Change in Arc Reciprocity</b>	0.485	<b>Change in Transitivity</b>	0.053
SS 06	<b>Change in # of Issues</b>	-1	<b>Change in Density</b>	0.05	<b>Change in Arc Reciprocity</b>	0	<b>Change in Transitivity</b>	-0.3
SS 12	<b>Change in # of Issues</b>	-1	<b>Change in Density</b>	-0.25	<b>Change in Arc Reciprocity</b>	0.333	<b>Change in Transitivity</b>	-0.935
SS 19	<b>Change in # of Issues</b>	-1	<b>Change in Density</b>	0.06	<b>Change in Arc Reciprocity</b>	-0.059	<b>Change in Transitivity</b>	-0.062
SS 22	<b>Change in # of Issues</b>	2	<b>Change in Density</b>	0.183	<b>Change in Arc Reciprocity</b>	0.571	<b>Change in Transitivity</b>	0.429
SS 29	<b>Change in # of Issues</b>	1	<b>Change in Density</b>	-0.191	<b>Change in Arc Reciprocity</b>	-0.1	<b>Change in Transitivity</b>	-0.085
SS 30	<b>Change in # of Issues</b>	4	<b>Change in Density</b>	0.267	<b>Change in Arc Reciprocity</b>	0	<b>Change in Transitivity</b>	0.485
	<b>Avg change in # of issues</b>	<b>+1.429</b>	<b>Avg change in Density</b>	<b>+0.022</b>	<b>Avg change in Arc Reciprocity</b>	<b>+0.176</b>	<b>Avg change in Transitivity</b>	<b>-0.059</b>

*Analysis of aggregate change of perceptions of SES interdependence*

The full networks of combined issues and connections from the seven individual survey responses are shown in Figures 4.8 and 4.9 with metrics listed in Table 4.12. The pre-survey network of issues was more fragmented than the post-survey network, with two sets of connected issues completely separated from the larger network of issues. The post-survey network had a slightly higher average degree and density than the pre-survey network. However, the arc reciprocity and transitivity were higher in the pre-survey than in the post-survey networks. This indicates that among the connections identified, the set of participants recognized more feedback loops among two and three issues in the pre-survey than they recognized in the post-survey. The connections in the pre-survey participants did see were more likely to be reciprocal or in smaller feedback loops. In the post-survey, participants were more likely to see connections between

issues, as shown by the higher number of ties, but not see those connections in small feedback loops of two and three issues. This is likely because individuals identified a broader set of issues in the post-survey that did not directly impact one another.

The most important thing to note here is the connectedness metric. This metric shows how connected all of the nodes are as a whole. The connectedness metric is much lower in the pre-survey. There are two completely separate components from the rest of the network of issues and a few instances where only one tie connected a set of issues to the rest of the network. This indicates individuals did not see all issues connected and that not everyone had identified the same set of issues. The post-survey network is much more cohesive, as indicated by the higher connectedness metric, which almost doubled from the pre-survey network. This implies individuals identified more of the same issues as one another and found more connections between those issues.

Table 4.12. Number of nodes, number of ties, average degree, density, transitivity, arc reciprocity, and connectedness of the aggregate networks of issues impacting dune and beach management that seven individuals identified in the pre and post surveys.

<i>Aggregate SES Network</i>	<b>Pre-Survey</b>	<b>Post-Survey</b>
<b>Nodes</b>	30	29
<b>Ties</b>	99	130
<b>Avg. Degree</b>	3.300	4.483
<b>Density</b>	0.114	0.160
<b>Transitivity</b>	0.313	0.163
<b>Arc Reciprocity</b>	0.828	0.692
<b>Connectedness</b>	0.499	0.996

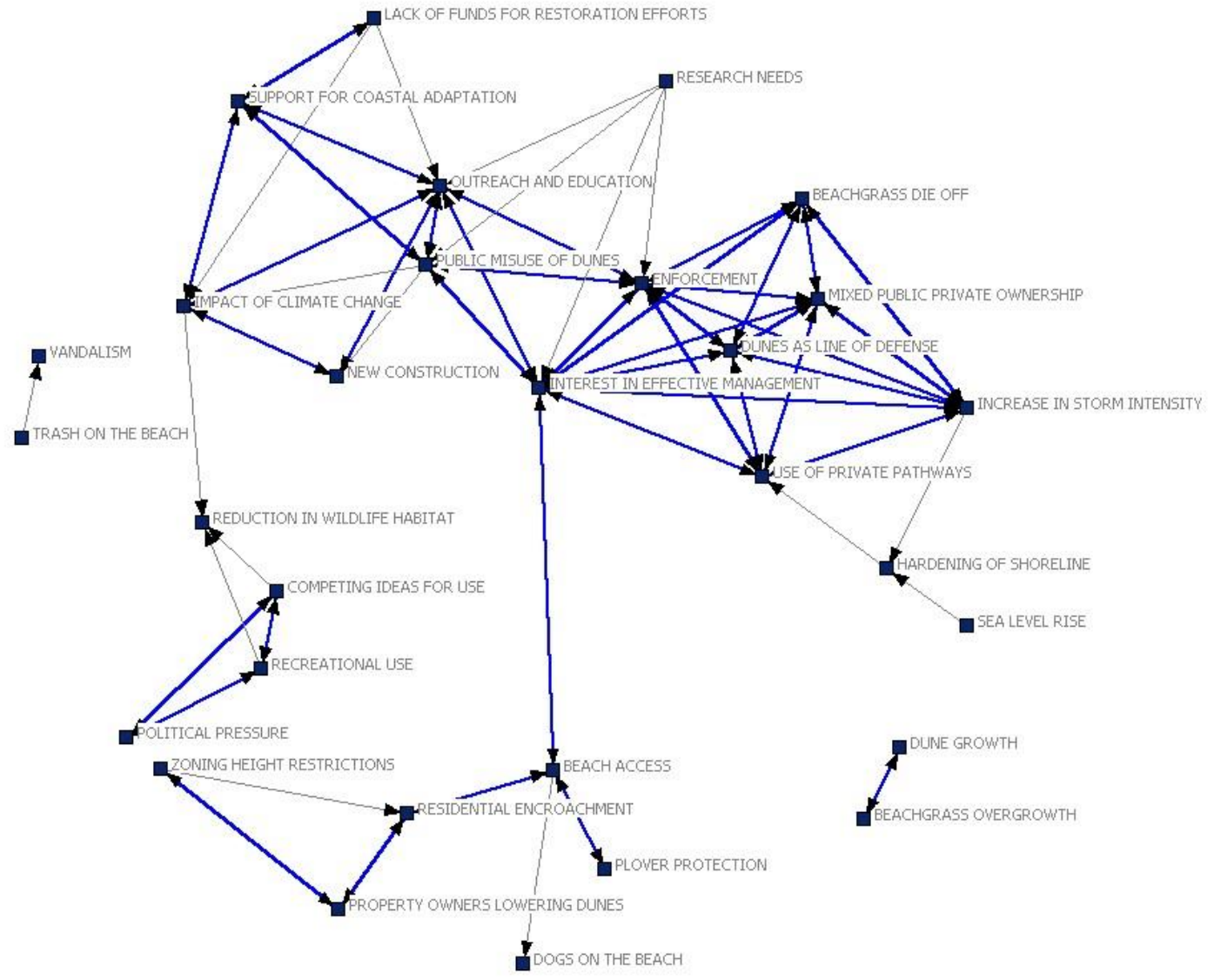


Figure 4.8. Network of combined SES data from pre-surveys of seven individuals. Reciprocal ties in blue.



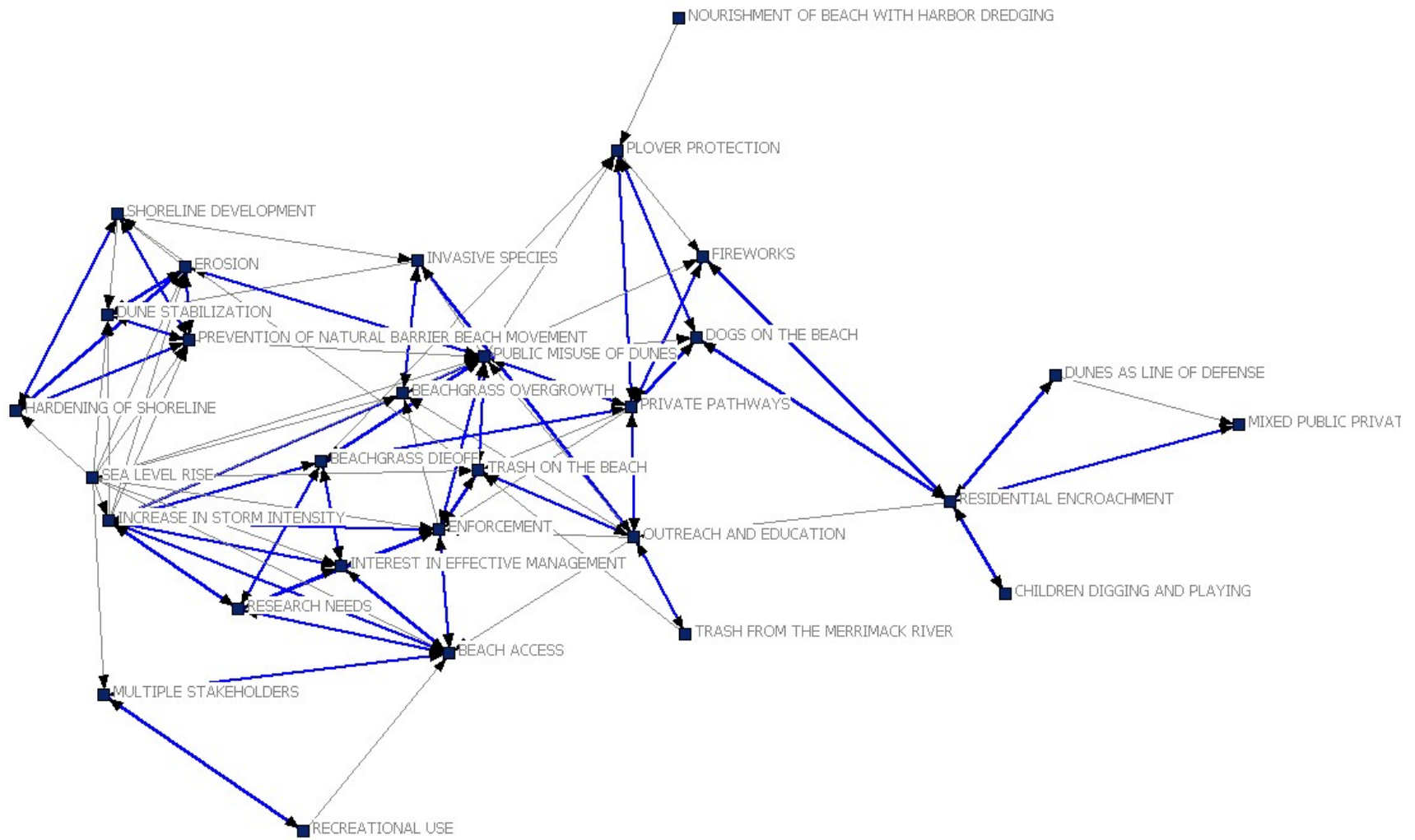


Figure 4.9. Network of combined SES data from post-surveys of seven individuals. Reciprocal ties in blue.

#### **4.4 Analysis**

The analyses support the conclusion that stakeholders' perception of interdependence changed for both stakeholder interdependence and SES interdependence following the SA. There was little change in the number of other stakeholders respondents identified as important to work with, the number of issues they identified, and the overall complexity of their perceptions. Instead, changes in the specific issues respondents identified and the stakeholders they identified as important indicate SA participants experienced some change in their perception of interdependence.

##### **4.4.1 *Stakeholder Interdependence***

The analysis of subset data indicates there was some increase from the pre- to the post-survey in how interdependent stakeholders perceived themselves to be. However, this small difference from one survey to the other is overshadowed by the much larger difference in network metrics from the survey networks to the interview data networks. Among the same set of stakeholders, more connections between fewer identified parties were shown in the interviews. This means the interviewed stakeholders as a whole were selecting from a smaller group of parties to identify and that they each identified more stakeholders. There were also reciprocal ties in the interview data, which were not present in the survey data. This finding, however, is likely skewed by the limited number of participants in this dataset. Reciprocity can be examined better in the full and participant networks.

Aggregate network analysis of the subset data showed stakeholders recognize the need to work outside of their own stakeholder group. There were reciprocal ties present in each aggregate network showing larger stakeholder groups perceive each other as interdependent.

However, there was not a clear difference between these sets of data to indicate which treatment showed the highest perception of interdependence among aggregate stakeholder groups.

Reciprocity was of particular interest because a set of stakeholders identifying one another as important to work with indicates recognition of interdependence by each of those groups, and in turn a willingness to collaborate with one another. Reciprocity was most obvious in the full and participant networks of interview data, when participants had time to consider who are specific people to work with. Time was available, but not used by stakeholders when taking the survey, as responding to the survey was similar to answering an email. There was slightly more reciprocity present in the full and participant networks of pre-survey data than in the full and participant networks of post-survey data. However, the post-survey data were only comprised of eight participants, as compared to 28 in the pre-survey. Without more post-survey respondents, a conclusion cannot be drawn on reciprocity in the full and participant networks.

While the network analysis provides a quantitative and structural look at the changes in how stakeholders perceived one another throughout the process, a qualitative analysis of the content of the responses provides a richer understanding. The network analysis shows little change between the pre- and post-surveys. However, changes in the content of those networks provide evidence for a change in respondents' perceptions of stakeholder interdependence. All of the participants added at least one new group in the post-survey they did not identify previously. This could indicate that over the course of the assessment the respondent learned about a group they didn't know about when they completed the pre-survey, they considered a group they identified in the pre-survey not important enough to be included in the post-survey, or they considered there might be more groups with a stake in the issues they cared about. While the quantitative results of the network analysis show only small changes in how SA participants

perceived stakeholder interdependence, the qualitative evidence supports the finding that the SA affected perceptions of stakeholder interdependence.

#### **4.4.2 *SES Interdependence***

Similar to the results for stakeholder interdependence, individuals showed a qualitative change in the issues they identified between their pre- and post-surveys. Most respondents changed more than half of the issues they identified as important. This change could reflect a longer time over which a respondent considered the issues in the system, or learning about certain issues as a result of participating in the SA and/or reading the assessment report. Three respondents put one less issue than they identified in the pre-survey. This could be because they gained a better understanding of which issues were important to them for dune and beach management and were more precise in identifying them. And, for three of the four cases in which respondents increased the number of issues they identified, the density increased, showing they saw more connections between the issues they identified after the SA, as compared to before.

The arc reciprocity and transitivity were higher in the aggregate pre-survey network than in the post-survey networks. This indicates participants recognized more feedback loops between sets of two and three issues in the pre-survey, as compared to the post-survey. This could mean the new issues participants identified in the post-survey were ones they recognized to be important, but were not necessarily as related to the set of issues that were most important to them. These results suggest individuals broadened the scope of the issues they consider important in dune and beach management.

The difference in shape of the aggregate SES networks shows a change in how the set of participants perceived the set of dune and beach issues in Seabrook. The pre-survey network is

fragmented, with at least two sets of issues isolated from the rest of the network and some sections of the network connected by only one tie. This shape reflects the aggregation of individual representations of the issues and their connections into one network, so the aggregate network appears as a set of smaller networks of interconnected issues sometimes connected by one tie because two people identified the same issue. The post-survey network is clearly less fragmented. No issue is completely isolated from the rest of the network and the metric of average degree indicates there is at least one more tie per node in the post-survey network as compared to the pre-survey network. There are no smaller sections of the network only connected by one tie. This indicates the different respondents identified more similar issues as important for dune and beach management in the post-survey. While this may not support that an individual perceived more SES interdependence than before participating in the SA, it does support the finding that this group of stakeholders perceived more of the same issues to be connected to one another.

## **4.5 Discussion of Findings**

### ***4.5.1 SA Outcomes and Perception of Interdependence***

Outcomes found in ADR interviews in Chapter 2 relating to participants' perceptions of interdependence were a change in the scope of issues considered and an increase in appreciation of the need to work with others on integrative solutions. These two outcomes are supported by the analysis of perceptions of SES and stakeholder interdependence among SA participants in Seabrook. ADR practitioners discussed the change in the issues that are considered part of a conflict and how that change can take place over the course of an assessment.

The changes in SES interdependence that ADR practitioners discussed were broadening the scope to include more issues in a collaborative process, or changing the scope to include different issues in a process than those about which the stakeholders were originally concerned. In Seabrook, the collective scope of issues changed for the stakeholders, but they became more focused. Prior to the assessment, there was not a lot of agreement among the entire set of stakeholders about what were the important issues. Officials unfamiliar with Seabrook Beach were concerned about general issues related to coastal management and resilience, while local stakeholders were concerned with local dune and beach issues they had personally experienced. Following the assessment, the collective set of identified issues focused only on what was directly related to the situation at Seabrook Beach, leaning closer towards the issues that local stakeholders had identified, with some coastal resilience issues as they directly relate to Seabrook. This indicates that state and federal officials learned about the specifics of Seabrook Beach from the SA while town and beach participants found an interest in coastal resilience issues that related to local management issues from the SA. Over the course of the assessment, stakeholders seemed to both learn more about the dune system in Seabrook and identify which issues would be able to be addressed by this set of stakeholders. Instead of broadening the scope of issues to consider, stakeholders in this assessment focused the set of issues so that they would be relevant for all parties.

While this analysis did not look at stakeholders developing integrative solutions regarding dune and beach management issues, it did evaluate how SA participants saw one another's interests as connected to their own, as seen in the connections identified by the stakeholders themselves. In order to begin to consider integrative solutions, stakeholders have to first begin to see other parties' interests as connected to their own and consider their perspectives

(Gray, 1989). Over the course of the assessment, stakeholders began to recognize which key parties had interests connected to their own. The parties identified by stakeholders changed from a large set of groups that included both broad categories of who should be involved and organizations that are involved in coastal management issues elsewhere, to a smaller shared set of groups who are all involved in coastal management issues in Seabrook specifically. The development of a smaller shared set of stakeholders addresses one of the key reasons for conducting a stakeholder assessment, which is determining who are the right participants (L. Susskind & Thomas-Larmer, 1999).

#### ***4.5.2 Connections between SES and Stakeholder Interdependence***

Similar patterns were found in the analysis of both SES and stakeholder interdependence. In the individual qualitative analyses, participants identified similar numbers of stakeholders and issues in both surveys but identified a different set of stakeholders and issues after the assessment. Stakeholders also seemed to become more similar in how they perceived the set of stakeholders and the issues of dune and beach management in the interview data, when it was available, and in the post-survey. Changes in perception of SES and stakeholder interdependence seem to go hand in hand. As stakeholders became aware of and considered the particular set of issues in the system, they likely became more aware of who those issues concerned. This finding relates directly to a point made by Ostrom (2009) about recognition of SES interdependence making actors more likely to organize themselves to address the SES issues (Ostrom, 2009). At the same time, as stakeholders learn about who the other key parties are, they identify the issues that are shared concerns, and don't identify the issues that are only concerns to themselves. These patterns highlight how SES and stakeholder interdependence are intertwined. Perceptions

of stakeholder interdependence cannot change without considering the shared issues stakeholders are interdependent around.

## **4.6 Discussion of Findings Related to Methodology**

### ***4.6.1 Weakness of Survey***

Overall, the interview data provided a more robust conception of how interdependence is perceived among stakeholder participants. While there was some increase in the measures of connectivity from the pre- to the post-survey, and definite qualitative changes, the interview data illustrate more complex interconnections, which were not present in the survey data. In the interviews, participants started with one issue, jumped to other issues they viewed as connected to the first, and wove in the stakeholders connected to each of those issues. The openness of the interview as an opportunity to consider many possibilities and have a conversation about ideas with another person is a forum more conducive to expressing perceptions about the interdependence of issues, interests, and stakeholders. My research experience indicates interviews may provide a better instrument for evaluating perceptions of interdependence, as compared to electronic surveys. However, conducting interviews is already part of the SA and therefore does not capture a pre-SA baseline.

I did not ask anyone directly if they thought their perception of the issues or whom they needed to work with had changed as a result of the SA. In hindsight, it would be interesting to try conducting only a post-SA survey asking these two questions. Alternatively, a series of post-assessment focus groups could be held to ask stakeholders about the impacts of the SA and specifically about any new stakeholders they see as important or issues they had not considered before.



#### **4.6.2 Survey Considerations**

During interviews, participants shared some confusion about the survey. Respondents were often unsure about what counted as an issue within the system or how to know if one issue impacted another. The survey was intentionally designed to be open-ended with blank spaces for issues and stakeholder groups in order to avoid limiting or biasing participants. However, this had the effect of leading to noticeable differences in how different respondents characterized the system at the beach, with some noting issues specific to Seabrook Beach, while others, particularly, State or federal employees, focused on issues common to coastal and beach communities in general. Some respondents said the open-ended questions made it difficult for them to complete the survey as they didn't even know what issue to begin with.

There was little quantitative change from the pre- to the post-survey in perceptions of both stakeholder and SES interdependence, but there was a more obvious qualitative change. While this may reflect a change in perceptions of interdependence, it may also reflect greater familiarity with the survey format and topic. Despite the effort to avoid influencing respondents, the survey itself may have impacted how participants viewed the dune and beach system and their own interdependence. For the pre-survey, participants were informed their answers would inform the subsequent SA interviews. During the SA interviews, many participants brought up their survey responses and were clearly thinking about how their responses would be read and reviewed for the interview. Some asked for a short explanation of what was intended in the survey so they could better understand if they completed it correctly. Despite assurances by the researcher that there is no correct way to complete the survey, these discussions may have impacted how participants responded to the post-survey. There were also significantly fewer

respondents to the post-survey than the pre-survey, which may reflect less incentive because there was no follow-up interview.

#### **4.6.3 *Hierarchy and Nestedness***

Nestedness of issues and organizations was not fully captured in this analysis. Nestedness is an important component of characterizing SES interdependence (Brondizio et.al., 2003). It is the nesting of smaller social or ecological issues or systems within larger systems. For example, the issues of ‘children running in the dunes’, ‘bonfires in the dunes’ and ‘volleyball games in the dunes’ all fall under the issue of ‘recreation in the dunes’. The limitations of conducting the survey electronically through Qualtrics did not provide a way to capture nestedness in the survey, but was addressed by highlighting specificity of issues in the descriptive changes of the individual SES analysis. Similarly, the hierarchy of organizations became an issue for the analysis of stakeholder interdependence. Participants identified larger groups in their survey responses, such as state agencies or the federal government, when they may have had specific agencies or functions of those organizations in mind. This hierarchy was difficult to express in the network analysis software, which does allow for and calculates ties between aggregated sets of groups, but has difficulty in expressing connections between a specific group and a larger set.

#### **4.7 Conclusion**

To the best of my knowledge, this research is the first time the connection between SA and perception of interdependence has been evaluated. Based on my findings, the SA does appear to have some impact on stakeholders’ perception of both stakeholder interdependence and SES interdependence. Individual stakeholders changed the issues and stakeholders they

identified. Stakeholders did not seem to change how much stakeholder interdependence they perceived between the pre- and post-survey network data, but the interview data show that, during the assessment, stakeholders narrowed who they need to work with and recognized more connections to one another. There was also more of a shared recognition of what the important beach and management issues were and how they were connected following the assessment. The Seabrook SAs did not dramatically change how many groups a single stakeholder perceives the need to work with or the number of issues they think are important, but it did shift the stakeholders' perceptions to indicate an increased willingness to work with one another and to recognize a more similar set of issues.

## **Chapter 5**

### **Summary, Lessons, and Reflections**

#### **5.1 Summary**

The goals of my thesis were to explore the connection between stakeholder assessment and perception of interdependence and evaluate the idea that stakeholder assessment could foster feelings of interdependence. I did this by surveying and interviewing ADR practitioners about the outcomes of stakeholder assessments they had conducted, conducting a stakeholder assessment in Seabrook, NH, and evaluating the effect an SA had on participants' perceptions of interdependence.

In considering the potential impacts stakeholder assessments can have on perception of interdependence, this research indicates there is some change in how stakeholders, at least in the case of Seabrook, perceived their interdependence as a result of the SA process. Practitioners spoke about how stakeholders in assessments they had conducted had been able to broaden the scope of issues they considered, at least in interviews, and potentially recognize the stakes of other parties in the process. Though these practitioners were not sure how long these changes in perceptions held or if transformation of relationships or perspectives was possible before engagement with others in a collaborative process, my research into perceptions of interdependence demonstrates some change in perspectives of stakeholders can occur from participation in an SA. My results also corroborated the emphasis practitioners put on having open-ended and flexible conversations in their interviews during the SA, because more nuanced information on the connections between stakeholders was obtained through my assessment interviews, as compared to the surveys I conducted.

### **5.1.1 Use of Stakeholder Assessments**

This research was able to look at how SAs are actually conducted in practice, not just how they would ideally be conducted, and how the assessment can impact the process that follows. Most of the practitioners engaged in this study saw the value of including SA in their practice in some form. Though they did not always include every step of an assessment as outlined in the literature, they valued the information that could be gained from interviews. The emphasis on interviews is supported by my findings from my network analysis that interviews are far superior to surveys in identifying connections between stakeholders. The time spent engaged in thoughtful conversation can provide rich information on relationships and the details of a conflict. Practitioners were particularly invested in the assessment as an opportunity for the mediator to become versed in the details of a situation. They were interested in developing their own impressions of the situation so they could use their best judgment on how collaboration should proceed (i.e., design of the collaborative process).

Practitioners were not necessarily committed to the guidance from the literature to share a written report with stakeholders; more often they used other methods, like oral reports to stakeholders and conveners. Depending on a situation, different methods of communicating results were used, and there was an implication that a report was not always shared with stakeholders. However, the written report is an opportunity for stakeholders to learn about the other perspectives and learn about the set of issues in a conflict from a value-neutral perspective. In Seabrook there was evidence from the post-survey that stakeholders had identified other organizations and specific issues based off of the written assessment report. Written assessment reports can be powerful; beyond making recommendations for how to proceed the assessment can change how stakeholders perceive one another.

ADR practitioners demonstrated that the SA was an opportunity to impact the rest of the collaborative process. They were able to develop relationships and trust with the stakeholders, determine relationship dynamics, and work with stakeholders to define their interests and BATNAs. These outcomes addressed conditions that, according to the literature, need to be met for a successful process. When explicitly asked about changes from the SA in stakeholder perceptions, most interviewed practitioners indicated they could not know about those changes because they had never asked stakeholders about them. They were not sure changes could necessarily come about before stakeholders meaningfully engaged one another in the collaborative process. However, they did discuss the opportunities in assessments for getting stakeholders to consider different points of view and other potential issues. The opening in stakeholder considerations that practitioners discussed reflects what I found in my analysis of changes in stakeholder perceptions. Stakeholders viewed themselves as particularly interdependent during the interview and post-surveys indicating they did change how they perceived dune and beach management issues and the other stakeholders.

### ***5.1.2 Seabrook Stakeholder Assessment***

The stakeholder assessment found the jurisdictional overlap of management of the dunes and the competing use of the beach by residents, visitors, and wildlife have led to a set of issues that can be addressed through collaboration. These issues include dune protection, wildlife and habitat protection, beach access and recreation, and harbor dredging. They are impacted by the difficulty of enforcing rules and laws on the beach and dunes and the threat of storm surge and sea level rise. The assessment report recommends a process designed to focus on providing input to the updated beach management plan, with subgroups focusing on (1) decisions regarding the

use of harbor dredge material to nourish Seabrook beach and related issues, and (2) short-term strategies to address gaps in scientific knowledge and meet some outreach needs. If successful, this process can form the basis for a longer-term collaborative process focused on a broader range of issues.

There was a willingness among stakeholders to engage in a collaborative process, with a consideration for time, staffing and funding constraints. While the assessment recommends representatives from specific stakeholder groups participate in subsequent collaboration, the network analysis completed following the assessment emphasized the importance of certain stakeholders. The Seabrook Town manager and selectmen were viewed as an important stakeholder group in the pre-survey, interview, and post-survey data and had reciprocal ties with many other organizations. The Beach Commission, the government body at Seabrook Beach, was also viewed as important and connected with other stakeholders, but not to the extent of the Town manager and selectmen.

Network analysis could be helpful for conducting SA analysis because it highlights important players, but also shows missing connections between stakeholders. This finding of the benefit of network analysis as part of SA is also identified in the ADR literature (Kivits, 2011; Lienert, et al., 2013; Reed et al., 2009). Network analysis could be a useful tool for other practitioners who want to find another way to highlight opportunities for collaboration.

### ***5.1.3 Potential Change in Perceptions of Interdependence***

The stakeholder assessment in Seabrook was an opportunity to evaluate if perceptions of interdependence could be impacted by participation in an assessment. While my results have to be qualified by the low response rate to the post-survey, my analysis shows SA can have effect

on stakeholders' perception of both stakeholder interdependence and SES interdependence. There were no major changes in the number of stakeholders or issues in the system and the overall complexity of what stakeholders perceived was the same before and after the assessment. However, the qualitative differences in the specific issues and in stakeholders identified indicate the SA did have an impact on stakeholders' perceptions. The individual qualitative analysis of both SES and stakeholder interdependence showed a discrete change in specific issues and stakeholders identified.

Stakeholders were also found to have more of a shared understanding of the issues important to beach and dune management in the post-survey. Participants learned what issues were important to other stakeholders during interviews, from the workshops, or from the written assessment. By engaging in the assessment, stakeholders began to frame the issues more similarly to one another. There was also a decline in the number of stakeholders identified in the pre-survey, as compared to the interview data and post-survey. The change could be interpreted as stakeholders developing a shared, recognized set of stakeholders important to addressing dune and beach management issues, and no longer identifying those who they had learned were less important in the Seabrook system. Overall, stakeholders appeared to have a better understanding of the issues and parties involved by participating in the assessment.

One conclusion from this research is the strength of the interview approach in determining how stakeholders perceive their interdependence. I did not originally intend to include interviews in the network analysis, but visualization of the interview data illustrated connections, which were not indicated by either survey analysis. Individual interviewees not only considered more stakeholders in the interviews and how they might relate to their own interests, but the overall network of how stakeholders viewed each other during the interview process was



dense in connections and reciprocal recognition of needing to work with one another. This was more than the connections I found from either set of survey data. The power of the interview that I found in my network analysis reinforced comments from ADR practitioners. The practitioners valued the information from interviews and the unexpected connections that could come from engaging stakeholders in an open and flexible manner. Interviews are an essential method in SAs, because more considerations of other stakeholders can be discussed, as compared to a survey. These conversations can lay the groundwork for potential collaboration between parties to address shared issues of importance.

## **5.2 Lessons Learned**

Conducting this research was an opportunity for me to learn a variety of skills and approaches. I became a skilled interviewer, interviewing 38 people in total, with different personal and professional backgrounds. I learned how to conduct a stakeholder assessment and gained knowledge from experienced practitioners about the value of a stakeholder assessment and the details of how to mediate a collaborative process. I created and conducted surveys using Qualtrics, which included learning about survey and question construction as well as how to use the Qualtrics software. I learned how to do qualitative analysis, coding surveys and interviews for themes and analyzing my coded results. I also learned the theory and practice of network analysis in order to analyze my interdependence data. I became acquainted with Ucinet and Netdraw in order to visualize and analyze the networks I created.

With hindsight I would revise some aspects of my research design and methodology. Our assessment report would be shared before the final stakeholder workshop to allow for a forum for feedback and an opportunity for in-person requests for responses to the post-survey. The

surveys would also be conducted differently. Since there was such a stark difference in the connections detected by the surveys as compared to the interview, I would try to measure changes in perception of interdependence differently. Although interviews were critical, conducting another set of interviews before or after the assessment would be redundant. It would also likely affect stakeholders' views and lead to participation fatigue. Therefore, I would use a survey or a small focus group to ask stakeholders directly if they felt their views about the issues or the other parties had changed.

In the future, if I were to do a stakeholder assessment for a collaborative process, I would focus on the in-person interviews. Survey data cannot replace what can be learned during a conversation. Interviews allow stakeholders to reflect on the situation and work through their positions and who they might need to work with. I would also likely incorporate the network analysis into the assessment itself. Network analysis allowed me to visually represent how closely stakeholders were connected and how similarly or dissimilarly they viewed the important issues. It could be helpful to show where stakeholders are not viewing issues in the same way and where there are opportunities for connecting stakeholders.

### **5.3 Reflections**

Although my SA analysis found changes in how participants perceive interdependence, ADR practitioners consider SA 'too light of a touch' to change relationships and views of the situation. In the case of Seabrook, the assessment seems to have had more of an effect than a 'light touch'. However, this finding is qualified by the fact that Seabrook is an upstream conflict. Stakeholders see the issues as important, although not urgent, and tensions are low. In my interviews with ADR practitioners, most respondents were reflecting on contentious downstream

conflicts. Also, practitioners may be viewing SA as ‘too light of a touch’ from the perspective they have at the end of a mediation. More dramatic changes in stakeholder perceptions could be found after a full mediation process than the more nuanced changes I found after the SA. Seabrook has not yet moved on to the next steps of collaboration and, while Seabrook stakeholders may be transformed significantly by a mediation process, as compared to the initial SA, this is not yet known.

My research did not investigate how SA may bring about changes in stakeholder perceptions. The act of reading the written assessment report may be important. Although everything in the report emerged from the SA interviews, some of the language participants used in the post-survey reflected framing and language used in the written assessment. However, it could also be that the workshops or some other component of the assessment have an impact on participants’ perceptions. It is possible stakeholders learned directly from one another over the course of the interviews and through interacting during SA workshops, or incidentally during discussions with one another about the SA outside of the process itself. However the SA affected participants’ perceptions of interdependence, I hope the changes I observed will help the stakeholders in Seabrook collaborate on the issues of dune and beach management and address other challenges of coastal resilience they will face in the future.

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## Appendix A

# University of New Hampshire

Research Integrity Services, Service Building  
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02-Jun-2016

Bialowas, Emily  
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**IRB #:** 6443

**Study:** Human and Ecological Interactions in Dune Systems: Is New Hampshire Ready to Build Resilient Coasts?

**Approval Date:** 26-May-2016

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Expedited as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 110.

**Approval is granted to conduct your study as described in your protocol for one year from the approval date above.** At the end of the approval period, you will be asked to submit a report with regard to the involvement of human subjects in this study. If your study is still active, you may request an extension of IRB approval.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the document, *Responsibilities of Directors of Research Studies Involving Human Subjects*. This document is available at <http://unh.edu/research/irb-application-resources>. Please read this document carefully before commencing your work involving human subjects.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or [Julie.simpson@unh.edu](mailto:Julie.simpson@unh.edu). Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,



Julie F. Simpson  
Director

## Appendix B

### Practitioner Interview Protocol

1. Could you please tell me about how you became a dispute resolution practitioner? How long have you been a dispute resolution professional?
2. Can you describe the range of disputes that you have experience mediating? What types of disputes are they? Do they tend to include regulatory agencies?
3. I would like to understand more about why you use SAs. (Is it primarily to get the range of issues, gauge the level of conflict, educate the mediator, pitch the process to participants, etc.?)
4. Are there any outcomes of an SA beyond your intended purpose? Is there an example that illustrates that?
5. Do you think the SA affects how participants view their relationship to other stakeholders? For example, have you seen relationships change? Can you give an example of that? Are there particular kinds of circumstances where you see these shifts happen?
6. Do you think the SA affects the range of issues participants consider important for addressing? Can you give an example of that? Are there particular kinds of circumstances where you see these shifts happen?
7. Do you have anything else to add about the usefulness of SAs?
8. Who else would you recommend I reach out to that has experience with conducting SAs?

## Appendix C

### SA Use Survey- for Practitioners

**Title of Study:** Use of SAs by Environmental Dispute Resolution Practitioners

Emily Bialowas, Graduate Student, under the supervision of: Dr. Catherine Ashcraft, Department of Natural Resources and the Environment, University of New Hampshire

**Research Purpose:** To better understand the use of SAs by environmental dispute resolution practitioners. Your participation involves answering questions regarding your use of SAs. The survey should take approximately 15-20 minutes. The anticipated participation in this survey is approximately 25 individuals. Following completion, you may be contacted to take part in a follow up interview. Participation in this survey does not imply consent to participate in an interview. Findings will be reported in public presentations and research publications. Support for this research comes from New Hampshire Sea Grant. Your consent to participate in this research is entirely voluntary. If you consent to participate you may refuse to answer any question and/or stop your participation at any time without any penalty or negative consequences. Participation in this study is expected to present minimal risk to you. You will not receive any compensation for participation in this survey. However, this research is intended to identify strategies to improve collaborative dispute resolution efforts and you could therefore eventually benefit indirectly from this research.

I will make every effort to maintain the confidentiality of all data and records associated with your participation in this research. However, you should know any communication via the Internet poses minimal risk of a breach of confidentiality. There are rare instances when I am required to share personally identifiable information. For example, in response to a complaint about the research, officials at the University of New Hampshire, designees of the sponsor(s), and/or regulatory and oversight government agencies may access research data. All data will be stored on password protected UNH computers. People with access to the data are: Dr. Catherine Ashcraft, Emily Bialowas, students and collaborating researchers in the UNH Environmental Policy, Planning, and Sustainability Lab under the supervision of Dr. Ashcraft. As part of this survey I will collect your name so that I may contact you with follow-up questions. However, results will be reported without attribution to any individual and will instead be reported in an aggregated manner. However, full anonymity cannot be guaranteed.

**Questions:** Please contact Emily Bialowas at [erm35@wildcats.unh.edu](mailto:erm35@wildcats.unh.edu) or Dr. Catherine Ashcraft at [catherine.ashcraft@unh.edu](mailto:catherine.ashcraft@unh.edu) or 603-862-3925. If you have questions about your rights as a research subject please contact Dr. Julie Simpson in UNH Research Integrity Services, 603-862-2003 or [Julie.simpson@unh.edu](mailto:Julie.simpson@unh.edu) to discuss them.

- Yes, I consent to participate in this survey
- No, I do not consent to participate in this survey

Q2 1. Are you familiar with SAs?

- Not at all
- Yes, have had training but no experience
- Yes, have some experience
- Yes, have extensive experience

Q3 2. How do you define what is a SA? (Please note: Below, the survey asks you to identify individual methods.)

Q4 3. In your career, how many environmental disputes have you mediated? (However you choose to define this.)

- 0
- A few (roughly 1-10)
- Some (roughly 11-30)
- Many (roughly 30+)

Q5 4. When you have mediated an environmental dispute, what percent of the time have you used a SA?

- 0%
- 1-24%
- 25-49%
- 50-74%
- 75-99%
- 100%

Q6 5. When you have mediated an environmental dispute and used a SA, why did you use it? For example, what were your goals and purposes or are there particular circumstances when you tend to use a SA?

Q7 6. When you have mediated an environmental dispute and did NOT use a SA, why didn't you use it? For example, are there constraints you commonly encounter?

Q8 7. When conducting an SA how often do you use these methods to identify stakeholder groups?

	Never	Sometimes	About half the time	Most of the time	Always
Web-based and document analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations by experts who are not stakeholders (e.g. hired consultants or your network)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations by stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommendations from the client/convener	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 8. When conducting an SA how often do you use these methods to gather information from stakeholders? Please note: From this point on in the survey, "stakeholder" refers to someone who was contacted to participate in the assessment.

	Never	Sometimes	About half the time	Most of the time	Always
One-on-one interviews	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surveys	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Focus groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soliciting individual feedback on draft assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soliciting feedback on draft assessment through workshop or focus group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10 9. When conducting an SA how often do you use these methods to analyze your data?

	Never	Sometimes	About half the time	Most of the time	Always
Tally and synthesis of most frequently expressed themes/opinions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visual representation connecting stakeholder groups, issues, and interests (e.g. actor-linkage matrix or stakeholder-interest table)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Network analysis of stakeholder connections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledge mapping (i.e. visual conception of relevant information and who has it)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Q11 10. When conducting an SA how often do you use these methods to communicate the results to stakeholders?

	Never	Sometimes	About half the time	Most of the time	Always
Written report shared only with stakeholders interviewed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written report shared publicly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
One-on-one discussion with stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral presentation to the client/convener	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral presentation/discussion with group of stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral presentation/discussion open to the general public	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 11. Is there anything else you would like to share about your use of SAs in environmental mediation that you think is important for understanding why you do or do not use them?

Q13 12. Please identify any additional practitioners whose perspective you think it would be important to include in this research. If possible please provide their organization information so I may contact them. Any suggestions will be kept confidential.

Q14 13. As part of this research, I will be following up on select survey response with interviews. If you are willing to participate in an interview, please write your name below. As a reminder, any survey results will be reported only in aggregate and will not be attributed to individuals.

## **Appendix D**

### **Draft Dune Management Participant Interview Protocol**

1. How did you become involved in beach and dune management in Seabrook? How are you currently involved?
2. What issues are important to you and why? Which issue is most important?
3. What issues do you commonly hear about from your constituents/other group members?
4. Who do you see as the other stakeholders in beach and dune management?
5. In general how happy are you with current management of these resources? Why/Why not?
  1. Do you think there is a need for a different way of managing the dunes?
6. Are there any upcoming regulatory or other changes that could force a change in how the beach and dunes are managed? Would you be willing to participate in a collaborative process for beach and dune management?
  1. Do you have any constraints to participating or things we should know to make it easier for you to participate?
  2. Would you have concerns about acting on a group's recommendations?
7. Who else would you recommend we speak with about dune management in Seabrook?
8. Is there anything else you would like to add?

# Appendix E

QID1.

**Title of Study: Human and Ecological Interactions in Dune Systems: Is New Hampshire Ready to Build Resilient Coasts?**

Emily Bialowas, Graduate Student, under the supervision of: Dr. Catherine Ashcraft, Department of Natural Resources and the Environment, University of New Hampshire

**Research Purpose:** The purpose of this research is to understand the issues and their connections surrounding beach and dune management in Seabrook, NH. Your participation in this survey involves answering questions regarding Seabrook beach and dune management. The survey should take you approximately 10-20 minutes to complete. We expect to engage at least 25 individuals. Participants must be at least 18 years old to participate in the study.

**Your consent to participate in this research is entirely voluntary.** If you do not consent to participate, you will not experience any penalty or negative consequences. If you consent to participate in this study, you may refuse to answer any question and/or stop your participation in the study at any time without any penalty or negative consequences. **Participation in this study is expected to present minimal risk to you.** You will not receive compensation for your participation in this survey. However, this research is intended to identify strategies to improve collaborative efforts in dune management and you could therefore eventually benefit indirectly from this research.

We seek to maintain the confidentiality of all data and records associated with your participation in this research. However, you should know any communication via the Internet poses minimal risk of a breach of confidentiality. There are, however, rare instances when we are required to share personally identifiable information (e.g., according to policy, contract, regulation). We will secure all interview transcripts and other research documents. As part of the survey I will collect your name so I may contact you with follow up questions. Results will be reported in an aggregated manner and you will not be directly identified or quoted unless you provide separate written consent to do so. All electronic files will be stored on password protected UNH computers. Audio-recordings will be erased upon completion of the research. People with access to the data are: Dr. Catherine Ashcraft, Emily Bialowas, students in the UNH Environmental Policy, Planning, and Sustainability Lab under the supervision of Dr. Ashcraft, and Dr. David Burdick, Dr. Gregg Moore, and Alyson Eberhardt. We anticipate that the research results will be reported in conference and workshop presentations, research reports, and/or scientific journals.

**Questions:** Please contact Emily Bialowas at erm35@wildcats.unh.edu or Dr. Catherine Ashcraft at catherine.ashcraft@unh.edu or 603-862-3925. If you have questions about your rights as a research subject please contact Dr. Julie Simpson in UNH Research Integrity Services, 603-862-2003 or Julie.simpson@unh.edu to discuss them.

**Yes, I CONSENT to participate in this research study.**

To give your consent, please write in your name and the date.

Name	<input type="text" value="Test Subject"/>
Date Consent Given (mm/dd/yyyy)	<input type="text" value="01/01/2017"/>

QID2. Please identify up to 10 key issues impacting dune and beach management and coastal adaptation in Seabrook.

For example, key issues impacting New Hampshire forests might be: forests on private land, tree disease management, public use of forests, invasive plants, the Northern Pass project, wildfires, etc.

Issue #1	<input type="text" value="A"/>
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QID3.

Issue #2	<input type="text" value="B"/>
----------	--------------------------------

QID4.

Issue #3	<input type="text" value="C"/>
----------	--------------------------------

QID5.

Issue #4

D

QID6.

Issue #5

E

QID7.

Issue #6

F

QID8.

Issue #7

QID9.

*This question was not displayed to the respondent.*

QID10.

*This question was not displayed to the respondent.*

QID11.

*This question was not displayed to the respondent.*

QID127. In order to understand how you view relationships between these key issues, these next questions ask you to identify how they impact one another.

QID128. Which of these other issues, if any, does A impact?

	A
B	<input type="checkbox"/>
C	<input checked="" type="checkbox"/>
D	<input checked="" type="checkbox"/>
E	<input type="checkbox"/>
F	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>

QID129. Which of these other issue, if any, does B impact?

	B
A	<input checked="" type="checkbox"/>

C  
D  
E  
F

Q172. Which of these other issue, if any, does C impact?

A  
B  
D  
E  
F

C

Q173. Which of these other issue, if any, does D impact?

A  
B  
C  
E  
F

D

Q174. Which of these other issue, if any, does E impact?

A  
B  
C  
D  
F

E

Q175. Which of these other issue, if any, does F impact?

	F
A	<input checked="" type="checkbox"/>
B	<input type="checkbox"/>
C	<input checked="" type="checkbox"/>
D	<input type="checkbox"/>
E	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>

Q177 Which of these other issue, if any, does impact?

*This question was not displayed to the respondent.*

Q178 Which of these other issue, if any, does impact?

*This question was not displayed to the respondent.*

Q179 Which of these other issue, if any, does impact?

*This question was not displayed to the respondent.*

Q180 Which of these other issue, if any, does impact?

*This question was not displayed to the respondent.*

QID139.

In order to meet your interests for the key issues you identified above, what groups would you consider working with and how critical would it be to work with them? (e.g., local non-profits, municipal, state, governmental, etc.)

Please enter the group and rank how important it would be to work with them.

	Extremely important	Somewhat important	Not important
Group 1	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group 2	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group 3	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group 4	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

QID138. Please review the draft stakeholder assessment report. Please provide any clarifications on the report here.

## **Appendix F**

### **Pre-survey list of issues**

Beach access  
Beachgrass die off  
Beachgrass overgrowth  
Climate change  
Competing ideas for use  
Dogs on the beach  
Dune growth  
Dunes as line of defense  
Enforcement  
Hardening of shoreline  
Increase in storm intensity  
Interest in effective management  
Lack of funds for restoration efforts  
Mixed public private ownership  
New construction  
Outreach and education  
Plover protection  
Political pressure  
Private pathways  
Property owners lowering dunes  
Public misuse of dunes  
Recreational use  
Reduction in wildlife habitat  
Research needs  
Residential encroachment  
Sea level rise  
Support for coastal adaptation  
Trash on the beach  
Vandalism  
Zoning height restrictions

### **Post-survey list of issues**

Beach access  
Beachgrass dieoff  
Beachgrass overgrowth  
Children digging and playing  
Dogs on the beach  
Dune stabilization  
Dunes as line of defense  
Enforcement  
Erosion  
Fireworks  
Hardening of shoreline  
Increase in storm intensity

Interest in effective management  
Invasive species  
Mixed public private ownership  
Multiple stakeholders  
Nourishment of beach with harbor dredging  
Outreach and education  
Plover protection  
Prevention of natural barrier beach movement  
Private pathways  
Public misuse of dunes  
Recreational use  
Research needs  
Residential encroachment  
Sea level rise  
Shoreline development  
Trash from the merrimack river  
Trash on the beach