Trust, Control, and Risk in the Salish Sea: A Case Study of the Transboundary Network Governing the Endangered Southern Resident Killer Whale

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Abstract

The Salish Sea is the inland body of water shared between Vancouver Island and the mainland of British Columbia and Washington. It is home to more than 100 endangered species, including the southern resident killer whale (SRKW, *Orcinus orca).* SRKWs first received the designation of endangered in 2003 in Canada, followed by the 2005 listing in the United States (U.S.). Despite their endangered status, the population of SRKWs continues to decline. Due to the home range of SRKWs spanning across the Canada-U.S. border, the recovery of this species poses a transboundary management challenge. Previous research suggests that one solution for complex environmental issues is inter-organizational collaboration. With governments unable to address transboundary natural resource management challenges on their own, diverse public policy networks involving a wide range of stakeholders may emerge. As the protection of the SRKW depends heavily on the successful collaboration between organizations and across jurisdictions, this thesis seeks to better understand the factors affecting SRKW governance in the Salish Sea. Key informant interviews (n = 32) and survey analysis (n = 35) with policy actors working for different organizations in Canada and the U.S. are used to explore how different dimensions of inter-organizational trust, perceived risk and control interact within the transboundary network to affect collaborative performance. Findings suggest that the SRKW governance network relies heavily on personal relationships and social control mechanisms to reduce the perceived risks of inter-organizational collaboration limiting network performance. The transboundary governance network is fragmented by jurisdiction, social expectations, unclear communication channels, and competition for resources, requiring careful management attention. Opportunities for integrating additional transboundary trust building activities and social control mechanisms with inclusive deliberative processes, as well as developing and supporting boundary-spanning actors in the

network, are identified. Applying a multi-dimensional trust, control, perceived risk framework to analyze inter-organization collaborative performance across jurisdictions has value to transboundary conservation objectives.

Résumé

La mer des Salish est une étendue d'eau située entre l'île de Vancouver et la partie continentale de la Colombie-Britannique et l'état de Washington. Elle abrite plus de 100 espèces en voie de disparition, incluant les orques résidents du Sud (*Orcinus orca*). Cette population d'orques a été désignée une espèce en voie de disparition en 2003 au Canada, suivi d'une même désignation aux États-Unis en 2005. Malgré leur statut, leur population continue de décliner. Puisque leur domaine vital est traversé par la frontière canado-américaine, le rétablissement de cette espèce pose un défi de gestion transfrontalier, qui dépend fortement sur la coopération de multiples agences opérant dans un réseau de gouvernance transfrontalier. Des études antérieures suggèrent que la collaboration inter-organisationnelle est une solution aux enjeux environnementaux. Étant donné que les gouvernements ne sont pas en mesure d'adresser les défis transfrontaliers de la gestion des ressources naturelles seuls, plusieurs réseaux de politique publique impliquant une grande variété de parties prenantes peuvent émerger. Puisque la protection de l'orque résident du Sud dépend fortement sur la collaboration entre les organisations et entre jurisdictions, cette thèse cherche à mieux cerner les facteurs affectant la gouvernance des orques résidents du Sud dans la mer des Salish. Des entretiens avec des informateurs clé (n = 32) et des analyses d'enquêtes (n = 35) avec des acteurs politiques travaillant auprès de différentes organisations au Canada et aux États-Unis sont utilisés afin d'explorer comment différents aspects de la confiance inter-organisationnelle, le risque perçu, et le contrôle interagissent au sein du réseau transfrontalier pour affecter la performance collaborative. Les résultats suggèrent que le réseau de gouvernance des orques résidents du Sud dépend fortement sur les relations personnelles et les mécanismes de contrôle social pour réduire les risques perçus de la collaboration entre organisations, limitant ainsi la performance du réseau. Le réseau de gouvernance transfrontalier

est fragmenté par les jurisdictions, les attentes sociales, les voies de communication peu claires, et la compétition pour les ressources, nécessitant l'attention attentive des gestionnaires. Des opportunités d'intégration de davantage d'activités bâtissant la confiance transfrontalière et les mécanismes de contrôle social avec des procédés inclusifs délibératifs, ainsi que développant et supportant les acteurs du réseau qui opèrent de chaque côté de la frontière sont identifiées. L'application d'un cadre multi-dimensionnel incluant la confiance, le contrôle, et le risque perçu pour analyser la performance collaborative inter-organisationnelle dans toutes les jurisdictions a une valeur pour les objectifs de conservation transfrontaliers.

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Contribution of Authors

I, Dane Pedersen, am the lead author of this thesis. Dr. Hickey, Dr. Temby, Dr. Sohns, Dr. Kim, and Evelyn Roozee will be listed as co-authors on any future publications adapted from this manuscript. Dr. Hickey provided funding, methodological guidance, research design, and feedback on this thesis. Dr. Temby assisted with building tables and figures, in addition to providing feedback and editing alongside Dr. Sohns. Dr. Kim was responsible for survey data compilation and statistical analysis. Evelyn Roozee created the survey using Qualtrics through the University of Texas Rio Grande.

Chapter 1: Introduction

1.1 General Introduction

The Salish Sea is the inland body of water between Vancouver Island and the mainland of British Columbia and Washington state. For part of each year, it is home to the southern resident killer whale (SRKW, *Orcinus orca*). The SRKW is a genetically and culturally distinct population of orcas, separate from northern resident, transient, and offshore killer whales which also inhabit the Salish Sea (Fisheries and Oceans Canada, 2017). These biological and behavioral differences arise from each group's unique food source and the communication and hunting strategies that have co-evolved in response (Ford et al., 2000). SRKWs feed primarily on fish, namely Chinook salmon, and cephalopods (Fisheries and Oceans Canada, 2017; Ford et al., 2000).

SRKWs first received the designation of endangered in 2003 in Canada under the *Species at Risk Act* (SARA) (Fisheries and Oceans Canada, 2017), followed by the 2005 listing in the U.S. under the *Endangered Species Act* (ESA) (National Marine Fisheries Service, 2008). Despite their endangered status, the population of SRKWs continues to decline. Only 74 individuals remain in the wild today, down from 83 in 2016 (Centre for Whale Research, 2020). However, major declines in the SRKW population are not a recent phenomenon. For example, the SRKW population lost almost 60 individuals to be sold into the zoo and aquarium trade during the 1960s and 1970s (Centre for Whale Research, 2020).

Despite their reduced population, the SRKW remains a highly charismatic species that continues to hold significant cultural and economic value in the Salish Sea. SRKWs are important contributors to Coast Salish lifeways (Collins, 1952; Gaydos et al., 2015). The Lummi Nation considers SRKWs to be of familial relation and have given the whales the traditional

name *Sk'aliCh'elh* (Indian Country Today, 2019). Economically, SRKWs are an essential part of British Columbia's and Washington state's tourism industry, which welcomes more than half a million people aboard whale watching vessels annually (Osborne, 1991). As of 1998, the Salish Sea whale watching industry was estimated to be valued at approximately $82.7 million USD per year (Hoyt, 2001). SRKWs have also garnered international media attention, specifically following the stories of two captivating individuals: Luna (Norman, 2015) and Tahlequah (Knoth, 2019). These whales have become an important icon for those living on the shores of the Salish Sea. Visitors can find SRKW public art projects scattered throughout coastal cities of the region. Even the 2010 Vancouver winter Olympics featured an orca-like creature as one of its mascots (Olympics, 2021).

Due to the home range of SRKWs spanning across the Canada-U.S. border, the recovery of this species poses a transboundary management challenge. While other transboundary natural resource management (NRM) efforts between the two nations have had some success (Gaden et al., 2021), the Salish Sea region is known to be fraught with collaborative challenges due to the general lack of transboundary governance structures. Previous initiatives, such as the Puget Sound Georgia Basin International Task Force, have since been disbanded, with no other formal strategies established to take their place (Wondolleck and Yaffee, 2017). In the case of transboundary SRKW conservation and management, Canadian and U.S. federal government agencies have struggled to address recovery challenges on their own, with diverse policy sub-systems involving a wide range of stakeholders affecting success (Harries and Penning-Rowsell, 2011). To address SRKW recovery, these stakeholders must interact with one another, both formally and informally, through complicated webs of communicative relationships. It is these relationships that provide the foundation of the SRKW governance network.

A major factor contributing to the limited success of collaborative species recovery efforts between Canada and the U.S. is the regulatory differences between the *Species at Risk Act* (SARA) in Canada and the *Endangered Species Act* (ESA) in the U.S. (Olive, 2014). For example, there are jurisdictional differences between federal and state/provincial responsibilities, differences in listing processes, species recovery procedures, and the legal protections afforded to different stakeholders and rightsholders either side of the border (Olive, 2014). To help understand the ways that jurisdictional differences can be bridged to ensure successful SRKW species recovery in the Salish Sea, this dissertation draws on collaborative governance literature.

Collaborative governance is an alternative approach to addressing issues that stretch beyond defined political borders (Emerson et al., 2012). When traditional state-centered attitudes cannot neatly extend to international application, such as in bodies of water, collaborative governance approaches become necessary to engage public and non-public stakeholders. Collaborative governance therefore tends to be an inclusive, "bottom-up" approach to decision-making, actions, and accountability that does not require centering on a single jurisdictional body (Graves, 2018). Due to the high public interest and diverse range of stakeholders involved in NRM, Bodin (2017) proposes that collaboration may be the most effective way to tackle environmental issues. For the purpose of this thesis, the following definition of a collaborative governance network by Ansell and Gash (2007) has been adopted: "A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (p. 544).

The SRKW governance network has already recognized the need for collaborative efforts (Jefferies et al., 2021). In particular, the requirement for collaboration across the international

border and between stakeholder groups has been noted in federal recovery plans for the species in both Canada and the U.S. For example, the "Action Plan for Northern and Southern Resident Killer Whales (*Orcinus orca*)" in Canada (Fisheries and Oceans Canada, 2017) states: "Implementation of these measures [for SRKW recovery] will be dependent on a collaborative approach, in which Fisheries and Oceans Canada is a partner in recovery efforts but cannot implement the measures alone" (p. 3). Similarly, the "Recovery Plan for the Southern Resident Killer Whale" in the U.S. (National Marine Fisheries Service, 2008) declares: "Recovery of the Southern Resident killer whale [distinct population segment] is a long-term effort that requires cooperation and coordination of West Coast communities from California to British Columbia" (p. vi). With a shared understanding that collaboration will be essential for the survival of the SRKW population, yet limited reported success with transboundary collaborative governance initiatives, this thesis seeks to better understand the factors affecting transboundary SRKW governance in the Salish Sea, drawing on concepts commonly used in inter-organizational strategic alliance network scholarship.

1.2 Research Question and Objective

The overarching objective of this thesis is to, for the first time, document and analyze the transboundary SRKW governance network. Using an integrated framework of trust, control, and perceived risk (Das and Teng, 2001; Hickey et al., 2021), I aim to explore how these concepts function (or do not function) within the governance network to support or inhibit SRKW recovery efforts. As it pertains to the Salish Sea region, my primary research question is: *What are the factors affecting the collaborative performance of the transboundary network governing the endangered Southern Resident Killer Whale?*

Using a mixed-method approach involving qualitative interview and quantitative survey data, I investigate the relationships that define the transboundary SRKW governance network and the ability for organizations to collaborate across boundaries. Chapter 2 presents a literature review of the theory and principles underlying ecosystem-based management and collaborative governance, and explains the central roles of trust, perceived risk, and control to collaborative performance. Chapter 3 details the research methods, including case study selection, data collection and analysis, and study limitations. Results are detailed in Chapter 4, followed by a discussion of the key findings and future research directions in Chapter 5. Chapter 6 concludes the thesis by considering the applications to transboundary SRKW governance.

Chapter 2 – Literature Review

2.1 Ecosystem-Based Management (EBM)

EBM is an environmental governance strategy that considers the broader ecological implications of management decisions. Now the reigning approach to NRM, EBM first appeared in the 1980s following concerns that traditional NRM approaches were unable to address larger socio-ecological issues (Layzer, 2008). Challenges of previous NRM strategies included top-down governance, poor management and integration of knowledge, and a lack of understanding regarding human impact and ecosystem functioning (Slocombe, 1993). Like many NRM ideological approaches, EBM suffers from semantic incoherence, with definitions varying widely between the academic community and those actively implementing EBM practices (Arkema et al., 2006). Thus, instead of using a single definition, I build an understanding of EBM by exploring the five principles Wondolleck and Yaffee (2017) identify as essential elements: scale, complexity, collaboration, balance, and adaptive management.

The scale of EBM networks should reflect the boundaries of the natural world, rather than those most convenient for administrative or political governance (Wondolleck and Yaffee, 2017). This revision of magnitude considers larger temporal and geographical scales than previous NRM approaches (Hughes et al., 2005; Leslie and McLeod, 2007). Socio-ecological systems are inherently complex, comprised of biotic and abiotic features. Management strategies, in turn, should reflect this intricacy. As governments struggle to address transboundary environmental issues on their own, diverse public policy networks have come to light. By engaging participants from an array of scientific, political, industrial, economic, and cultural backgrounds, policy decisions can mirror the diversity of the natural world through which complexity can emerge. A broad range of stakeholders also contributes to collaborative

performance by offering multiple perspectives and sources of knowledge to address NRM issues (Bodin, 2017). To ensure a balanced approach to NRM, we must place equal importance on human needs and the needs of the ecosystem. To do so, it is essential that humans are considered an integral part of the socio-ecological structure rather than separate from it (Layzer, 2008). Nonetheless, this balancing act is not always immediately obvious or straight-forward. Scientific research is required to inform our understanding of ecosystem capacities and the impacts of human activity. Only through this lens of continual learning can we become adaptive managers. However, many EBM networks are built on the foundations of an outdated NRM approach that is not adequately equipped to operate within a more integrated framework (Hughes et al., 2005). Therefore, large-scale institutional re-structuring may need to take place to effectively implement the necessary constituents of EBM.

2.2 Collaborative Governance in NRM Networks

American federal environmental policies implemented in the early 1970s, such as the *Clean Air Act*, the *Clean Water Act*, and the *Endangered Species Act*, were the first of their kind. These policies successfully addressed specific concerns regarding pollution and species protection. However, the triumphs of such Acts were limited and could not adequately confront broad, transboundary environmental issues (Gerlak et al., 2013). US federal government departments, like the Environmental Protection Agency, have commented on the limitations of top-down governance and have argued in favor of a more integrated approach to NRM (Margerum and Whitall, 2004). As public interest in NRM has grown and governments alone recognize they are unable to meet the demands of an EBM perspective, a new paradigm for NRM has emerged: collaboration.

Although Elinor Ostrom received the Nobel Prize in Economics for her scholarship in 2009, she and other academics have been discussing the value of collaborative governance in NRM for nearly four decades (Ostrom, 1990). The goal of this mode of governance is to create a collective vision and understanding of a complex issue. Building on Ostrom's legacy, Emerson et al. (2012) provide the following definition of collaborative governance:

> "The processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished" (p. 2).

Furthermore, Ansell and Gash (2007) identified six properties necessary for collaborative governance:

> "1) the forum is initiated by public agencies of institutions; 2) participants in the forum include non-state actors; 3) participants engage directly in decision-making and are not merely "consulted" by public agencies; 4) the forum is formally organized and meets collectively; 5) the forum aims to make decisions by consensus; 6) the focus of collaboration is on public policy or public management" (p. 544).

Achieving collaborative governance is no easy feat. For these criteria to be satisfied, network actors must communicate, develop trust, share goals, and demonstrate commitment to their vision (Ansell and Gash, 2007).

Collaborative governance in NRM networks is inherently transboundary, as it requires cooperation between two or more agencies or jurisdictions. If NRM practices are expected to operate in accordance with ecological boundaries instead of political ones, collaboration across

jurisdictional borders may be necessary. Geographical borders do not only represent the start or end of a jurisdiction, but also reflect the complex history of an area. For instance, Olive (2017) notes that although the Great Plains of North America stretch across Canada, the U.S., and Mexico, the colonial influences and protective laws of each nation has resulted in divergent approaches to species conservation. To further illustrate this point, Thornton et al. (2018) document the case of the Canada lynx (*Lynx canadensis*). Over-harvesting and habitat loss on the Canada-U.S. border endangers ecological connectivity, threatening to splinter the population in two. For transboundary species conservation efforts to be successful, agencies must acknowledge that they are dependent on one another to achieve desired outcomes (Ansell and Gash, 2007).

The term transboundary is not limited to geographical borders but may also describe boundaries between organizations. In his case study on transboundary conservation areas in South Africa, Schoon (2013) discusses how institutional structure influences inter-organizational collaboration. While cross-border institutions were able to develop inclusive, bottom-up processes to facilitate collaboration, local-level institutions were never able to overcome the top-down procedures and policies thrust upon them, leaving actors unable to effectively work together. Successful NRM institutional design should therefore consider the needs of local organizations and communities (Gallardo et al., 2013) and foster inter-organizational collaboration through the creation of trust-building (Ansell and Gash, 2007), knowledge sharing, and social learning (Yang, 2017) opportunities.

2.2.1 Characteristics of Collaborative Governance

A meta-analysis by Tonelli et al. (2018) identified six properties that are necessary antecedents for a collaborative governance network to function: multiple actors, common goals,

facilitative leadership, preliminary rules, interdependence perception, and initial investment. These properties and their influences are summarized in Table 2.1.

A primary feature of a collaborative governance network is the engagement of multiple actors, both state and non-state (Ansell and Gash, 2007). Each organization brings unique skills, perspectives, experiences, and resources to the whole, promoting the inclusion of diverse opinions and approaches in decision-making processes (Foster-Fishman et al., 2001). Despite varying interests, it is paramount that actors in a collaborative network identify a shared vision or goal (Ansell and Gash, 2007). These shared goals will become the foundation of future collaborative efforts and need to be the center of attention in the network from its inception (Emerson et al., 2012). Opposing agendas, should they become the focus of action, can derail cooperation and destabilize the network (Ansell and Gash, 2007).

Network leaders are individuals who act in the interest of collaborative governance. They need not wear a manager's hat to be effective. Rather, they are what Tonelli et al. (2018) call a "neutral citizen" and can occupy any number of positions in a governance network. Ansell and Gash (2007) recognize that leaders are essential for the formation and maintenance of trust. Leadership is not a static label assigned to a handful of individuals – it is dynamic and shared among members of the community.

Preliminary rules are the founding principles of how a network chooses to operate and should be established prior to collaboration. Freeman (1997) posits that these rules can be changed as needed to fit the demands of the network. Foster-Fishman et al. (2001) note that, regardless of their iterative nature, these rules must be clear to all parties. Among these rules should be descriptions of each member's role, so each organization knows exactly which

Table 2.1. A summary of the six antecedents necessary for a collaborative governance network, the six features of the collaborative process, and their respective influences. Adapted from Tonelli et al. (2018).

Stage	Properties	Influence over the quality/nature of:
Antecedents	Multiple actors	Decision-making process; resource access
	Common goals	Collective gains and power balanced
	Facilitative leadership	Achieving results; solving conflicts; including motivating actors
	Preliminary rules	Behavior and role of actors; the relationship between actors
	Interdependence perception	Skills; information access
	Initial investment	Tangible and intangible resources
Collaborative Process	Inclusive deliberative process	Democratic process; active participation; legitimacy of the decision-making processes
	Commitment to the process	Maintenance of collaboration and coalition perception; permanent motivation; innovation
	Trust building	Active collaboration; collaboration experiences; motivation of actors
	Internal and external relationships	Co-creation; social capital; improving collaboration potentials; networking
	Consensus building	Communication; equity of interests; shared understanding
	Knowledge management	Sharing of information; network performance

piece of the puzzle they are responsible for (Ansell and Gash, 2007; Foster-Fishman et al., 2001).

Finally, collaborative networks will only form when actors believe that working together is the only way to achieve a desired outcome (Choi and Robertson, 2014; Emerson et al., 2012; Robertson and Choi, 2012). Thus, interdependence is vital for maintaining collaboration. In order for a collaborative process to begin, there must be an initial investment (Weber and Khademian, 2008). This investment includes both the material, such as financial backing, technology, and physical resources, and the abstract, like knowledge, culture, and skills (Tang and Tang, 2014).

While collaborative governance is widely heralded as the best strategy for tackling complex and transboundary environmental challenges (Bodin, 2017), it does not come without difficulties. For instance, consensus building is a key property of the collaborative process. Even though achieving consensus when implementing a policy has many benefits, it also has the potential to create power imbalances. Gerlak et al. (2013) note that when a unanimous decision is required, a single actor can prohibit a policy from passing by vetoing the action, even if an overwhelming majority favor it.

Since the 1990s, academic interest in the collaborative performance of NRM networks has exploded. While often praised for its inclusivity and innovation, collaborative approaches do not come without methodological and theoretical challenges. Thomson et al. (2009) discuss the absence of a unified definition for collaboration, attributing the lack of semantic coherence to diverse conceptual perspectives, multidisciplinary approaches, and case-specific research. Despite the deficit of a singular model, there are several aspects of NRM collaborative governance that scholars in this discipline agree on. The pre-collaborative network state is described as the independent movement of actors, each behaving in a way that will satisfy their own objectives (Bouwen and Taillieu, 2004). Slowly, and under the correct circumstances,

individuals and organizations may begin to concert their efforts to create a united vision and consensus-driven decision-making process. Successful collaboration in NRM networks therefore has two requisites: recognition that the desired outcome of a policy network cannot be achieved by a single actor (Emerson et al., 2012; Song, 2020), and that the perceived risk of creating an alliance between two or more actors is lower than the perceived risk of not creating an alliance. In other words, the reward of working together must be greater than the risk of failing (Supper et al., 2015). Booher and Innes (2002) note that interdependence between actors is essential for collaboration, as it brings agencies together and keeps them integrated into the larger system.

The shift of power from a central institution to non-state actors is rarely an easy transition, as an NRM network must have both the ability and enthusiasm to take on responsibility. According to Vodden (2015), actors must be willing to learn, adapt, share knowledge and resources, and take accountability to achieve collaboration.

Tonelli et al. (2018) describe six properties of the collaborative process:: inclusive deliberative process, commitment to the process, trust building, internal and external relationships, consensus building, and knowledge management. These properties are also summarized in Table 2.1.

Inclusive deliberative processes bring stakeholders together, encourage conflict and resolution, and generates shared knowledge (McDougall et al., 2013). The organization of such processes is of the upmost importance. Choi and Robertson (2014) note that deliberative structures should be kept small enough to maintain member participation and offer the suggestion of dividing forums into smaller councils or tables. This strategy does have drawbacks, as it makes a unified consensus between divided groups more difficult. Inclusive deliberative processes lose legitimacy over time is there not buy-in from involved members. Thus, it is

important that collaboration is prioritized over other individual or organizational agendas. Encouragement to remain committed to these processes comes from all parts of the network: from management, other organizations, stakeholder groups, and the network as a whole (Foster-Fishman et al., 2001). Those in leadership positions are responsible for motivating their subordinates to remain engaged in collaboration where possible (Weber and Khademian, 2008). Trust is a cohesive force when it exists at appropriate levels and can emerge at any time during the collaboration process (Van Oortmerssen et al., 2014). Weber et al. (2007) assert that when trust levels are high, partnerships are more likely to persist. Nonetheless, the absence of trust may not be a deal-breaker for a network. Specific control mechanisms can be introduced to counterbalance the effects of distrust (Hickey et al., 2021).

Communication is essential for collaboration (Foster-Fishman et al., 2001), both internally and externally. Partnerships must span government, community, and non-state entities, ensuring that all relevant stakeholders are engaged in and see value in collaboration (Foster-Fishman et al., 2001). Consensus is generally the desired outcome of collaborative efforts, and often comes to fruition through inclusive deliberative processes (Robertson and Choi, 2012). Actors should not push individual agendas at the expense of other members (Ansell and Gash, 2007), as all stakeholders need to believe that they are valued within the collaborative environment. Finally, communication also plays a key role in knowledge management. To ensure frequent and sustained communication between organizations, there needs to be a certain degree of trust or other control mechanism present. In addition to knowledge sharing, Van Buuren and Nooteboom (2010) contend that shared learning opportunities may decrease the amount of conflict associated with differences in knowledges across a network.

2.2.2 Managing Inter-Organizational Collaboration Performance

To help conquer the collaborative barriers known to inhibit transboundary management, scholars have operationalized concepts to describe and measure inter-organizational collaborative performance. In strategic alliance theory, perceived risk is considered the main barrier to inter-organizational collaboration, with various dimensions of trust and control interacting to mitigate different dimensions of perceived risk over time (Das andTeng, 2001; Hickey et al., 2021). In their 2001 publication titled "Trust, control and risk in strategic alliances", Das and Teng constructed an integrative framework to demonstrate the dynamic linkage between these concepts in a collaborative management network. Hickey et al. (2022) adapted this framework to a NRM context, integrating new dimensions of trust and perceived risk (Anderson et al., 2014; Das and Teng, 2001; Stern and Coleman, 2015). In what follows, I briefly review each of the main concepts and associated dimensions presented in this framework (see Figure 2.2).

2.2.2.1 Trust

Like collaboration, the literature on trust is fraught with a multitude of definitions (Davenport et al., 2007), drawing from economic, psychological, sociological, and commerce perspectives. In this thesis, we will use Stern and Coleman's (2015) definition of trust: "A psychological state in which one actor (the trustor) accepts some form of vulnerability based upon positive expectations of the intentions or behavior of another (the trustee), despite inherent uncertainties in that expectation" (p. 118).

Stern and Coleman (2015) operationalize trust as a multidimensional concept composed of four unique types: dispositional, affinitive, rational, and procedural. *Dispositional trust* is an

individual's inherent propensity to trust others. This form of trust is personal and reflects one's experiences and world view. While dispositional trust can influence actions and the perceptions of others, it tends to remain constant, regardless of environmental change. For this reason, we acknowledge the role of dispositional trust at an individual level, but ultimately exclude it from our dyadic analysis due to its static nature. *Affinitive trust* is based on the emotions that one actor feels toward another. These interpersonal judgements can be conscious or unconscious, and often reflect a history of interactions. *Rational trust* is built on the beliefs one holds about another's competence. Mayer et al. (1995) use terms like "ability" and "expertise" to further illustrate the kind of characteristics that may increase rational trust. Finally, *procedural trust* is derived from the procedures, structures, and systems that allow a network to function, even in the absence of other forms of trust (Stern and Coleman, 2015). High levels of procedural trust can promote predictability in the actions of others. It is distinct from other forms of trust because it concerns confidence in the system, rather than an individual or alliance (Coleman and Stern, 2018b).

Trust exists on a spectrum and can operate in two directions – one can trust, and one can distrust. While trust and distrust are active states, implying previous interactions that were positively or negatively received, there may also be a lack of trust, especially in situations where there has been no previous relationship between the trustor or the trustee.

2.2.2.2 Control

Leifer and Mills (1996) define control as: "A regulatory process by which the elements of a system are made more predictable through the establishment of standards in the pursuit of some desired objective or state" (p. 117). Put another way, control is the mechanisms, both formal and informal, an organization can use to influence collaborative performance.

Das and Teng (2001) identify behaviors (behavioral control) and outcomes (output control) as two indicators that can be measured and formally controlled for within a network. *Behavioral control* dictates the process, or the way through which individuals or organizations act (e.g. sign in a restaurant bathroom encouraging employees to wash their hands before returning to work (Edwards, 2014)). *Output control* mechanisms assess organizational or individual functioning, and therefore, require reliable measurements to set acceptable targets (e.g. monitoring the number of visits a website receives in a day (Edwards, 2014)). *Social control*, also referred to as clan control, uses a more informal approach, creating a shared culture of values, goals, and norms to promote strong alliance collaborative performance (e.g. managers encouraging subordinates to "rat out" their colleagues for breaking company rules) (Das and Teng, 2001). These three control mechanisms may be exercised individually but are often used in conjunction or integrated with one another in inter-organizational alliances.

2.2.2.3 Perceived Risk

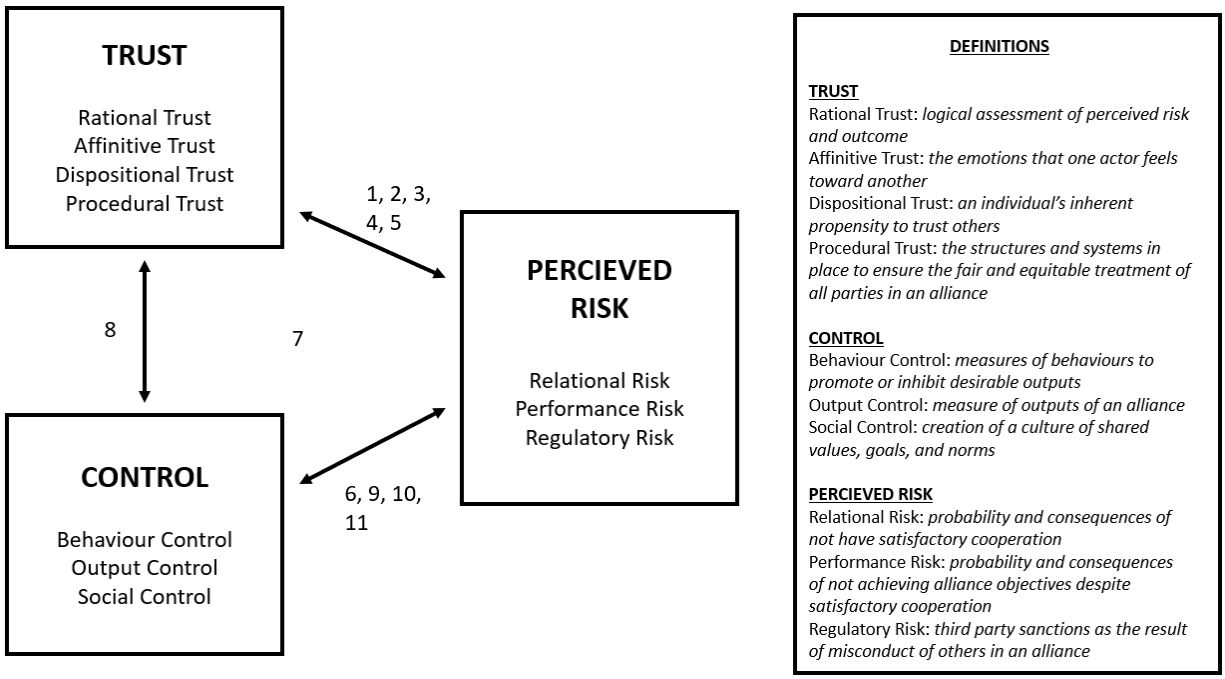
First, it is necessary to establish that risk and perceived risk in the context of collaboration are not the same. Risk refers to the definitive dangers associated with entering an alliance. Perceived risk, on the other hand, is a calculation of the expected dangers associated with entering a partnership, which can only be made with the available information. Therefore, levels of risk and perceived risk do not have to align – it is possible to have high levels of risk but low levels of perceived risk in relationship, or vice versa.

Perceived risk can be broken down further into perceived relational, performance, and regulatory risk. Das and Teng (2001) describe perceived *relational risk* in alliances as "the probability and consequences of not having satisfactory cooperation" (p. 253). They define

perceived *performance risk* as "the probability and consequences that alliance objectives are not achieved, despite satisfactory cooperation" (p. 253). Perceived *regulatory risk* is identified in the literature later and mentioned less consistently than other perceived risk types, yet it plays a key role in alliance dynamics. Perceived regulatory risk is the likelihood and results of incurring negative consequences (e.g. sanctions, fines, gossip, negative press) as a repercussion of their partnership or association with an actor that violates the rules of a collaborative network (Anderson et al., 2014). Identifying the kind of perceived risk present can help network managers to identify strategies to reduce or better share perceived risks across an alliance.

2.2.2.4 Integrating the Concepts to Inform Network Management

I now briefly explore the nuanced relationships between trust, control, and perceived risk. Within inter-organizational alliance networks, one should think of perceived risk as the product of trust and control interactions, rather than the sum. This point is best illustrated when exploring the complexity of applying a control mechanism. Although known to lower some types of perceived risk when implemented correctly, formal control tactics may have adverse effects on collaborative performance, namely reducing trust. For instance, by requiring that fishers subscribe to a pre-determined quota, some fishers may feel that their superiors do not trust their judgement to catch the appropriate number of fish given the size of the year's run. Thus, even though an output control mechanism is applied to reduce the risk of overfishing, the reduction in one or more types of trust may result in other negative outcomes. The nuanced complexities of the relationships between these concepts has application in transboundary NRM collaborative networks (Hickey et al., 2022). Figure 2.1 summarizes the integrated framework and lists the hypothesized relationships between the inter-dependent and multi-dimensional concepts.



#	*Hypotheses:*
1	Affinitive trust between organizations will reduce perceived relational risk in a collaborative NRM network, but not perceived performance risk.
2	Rational trust between organizations will reduce perceived performance risk in a collaborative NRM network, but not perceived relational risk.
3	Procedural trust will reduce perceived compliance and regulatory risk in a collaborative NRM network.
4	Low levels of dispositional trust among NRM network participants will lead to high levels of risk perception in all types.
5	Procedural trust in organizations will enhance affinitive and rational trust in a collaborative NRM network.
6	Social control will enhance affinitive, rational, and procedural trust in a collaborative NRM network.
7	Both output and behavior control will undermine affinitive and rational trust but enhance procedural trust in a collaborative NRM network.
8	Affinitive, rational, and procedural trust will enhance all management control modes (behavior, output, social) in a collaborative NRM network.
9	Perceived relational and regulatory risk in a collaborative NRM network will be reduced more effectively by behavior control than by output control.
10	Perceived performance risk in a collaborative NRM network will be reduced more effectively by output control than by behavior control.
11	Social control will reduce both perceived relational and performance risk in a collaborative NRM network.

Figure 2.1 Integrated framework of trust, control, and perceived risk in collaborative NRM networks. Hypotheses describing relationships between concepts are listed and numerically inserted within the framework between relevant concepts [Hickey et al. (In Review, 2022), adapted from Das and Teng (2001), Anderson et al. (2014), and Stern and Coleman (2015)].

Chapter 3 – Methodology

3.1 Statement of Positionality

I was born and raised in the driest parts of British Columbia's interior. I grew up in a well-off family in a middle-class neighborhood among people that looked and thought like me. My childhood was spent outside playing soccer, skiing, hiking, and camping. These activities drew me closer to and fostered my interest in the natural world. My parents have always supported my inquisitive mind and encouraged me to ask questions. I thrived in the structured school environment and was blessed with several excellent teachers that inspired me to pursue my passion for science. I completed my Bachelor's of Science degree in Biology at the University of Victoria in 2019. I concentrated my studies on conservation, climate change, and ecology. Although I am a proud woman in science, I found the methodological constraints of biological sciences limiting and inadequate to investigate environmental issues from an interdisciplinary perspective. In this thesis, I wanted to explore a new space – the grey area between science, social science, and policy. During my seven years living in Victoria, I was able to build relationships with several SRKW governance network actors. These relationships have provided guidance, networking opportunities, and interview participation in my research.

Due to my background in natural sciences, I have a strong tendance to believe that reliable evidence should be used to inform decision-making. I am naturally drawn to others that share this viewpoint. I attempted to account for this perspective in my interviews by trying to place participant comments in the context through which they were formed. For many respondents, the protective measures surrounding SRKW directly affect their livelihoods. I was, for the first time, challenged by the economic implications of environmental policies. While I am

still learning to embrace viewpoints that conflict my own, I believe this exercise allowed me to relate to and empathize with those who are different than me. For this, I am grateful.

3.2 Case Study Selection

3.2.1 Why SRKWs?

As in many productive marine waters around the world, fisheries in the Pacific Northwest are experiencing rapid declines, including those of Dungeness crab (Brown and Jefferson, 2018), Chinook salmon (Chasco et al., 2017), and multiple species of shellfish (Norman, 2019). No exception to this trend is the SRKW. I selected the SRKW as the subject of my research for two reasons. First, while a plethora of human-caused ecosystem changes are drivers for the collapse of some fishery stocks, the effects of our species on others can be observed most keenly in dominant predators, such as the SRKW. Generally speaking, the SRKW governance network has come to an understanding that there are three main issues threatening the survival of this species: a lack of prey availability, vessel traffic and noise, and habitat contamination (National Marine Fisheries Service, 2008).

The second reason to investigate the case of the SRKW is its endangered status in both Canada and the U.S. When a species is listed as endangered in either country, a slew of legal protocols come into play, immediately engaging a large range of stakeholders. In addition to the activation of local, Indigenous, state/provincial and federal governments, NGOs, and various industries, the SRKW attracts an incredible amount of public attention. Through the interaction of these legal and social responses to SRKW population decline, tremendous funding and research opportunities have become available for species recovery efforts. In fact, the Canadian federal (Fisheries and Oceans Canada, 2018) and Washington state governments (Inslee, 2018)

have committed more than $1.3 billion to species recovery efforts. With a prior understanding that the SRKW recovery space would be diverse, complex, and mobilized, the SRKW presented an excellent candidate for the description and analysis of the transboundary governance network responsible for the preservation of the species.

3.2.2 A History of Salish Sea Transboundary Governance

The Salish Sea is a single body of water shared between what is now Canada and the U.S. Prior to settlement by non-Indigenous people from Europe and beyond, the Coast Salish governed the Salish Sea and lived sustainably on its shores since time immemorial. Today, under colonial rule and Western ideologies, the governance of this region looks very different. Policy decisions made on one side of the border have the potential to directly impact the country on the other, as well as sovereign Indigenous nations and non-human organisms inhabiting the Salish Sea. While state and non-state practitioners of NRM have expressed a need for a collaborative transboundary approach to govern the Salish Sea for decades (Fraser et al., 2006), there still does not exist a single international body or task force to address transboundary concerns. Furthermore, there are no transboundary management strategies for the assessment of development projects in the Salish Sea (Gaydos et al., 2015).

While aquatic and marine transboundary collaborative NRM endeavors exist between Canada and the U.S. (Song et al., 2019), most successful projects are limited to the Great Lakes and Eastern coast. Wondolleck and Yaffee (2017) posit that there is a fundamental difference between the transboundary NRM approaches in the marine environments of the Pacific and the Atlantic. Specifically, they discuss the Gulf of Maine Council on the Marine Environment (GOMC) and Puget Sound Georgia Basin International Task Force (PSGB Task Force) as

examples. Table 3.1 summarizes and compares the origins, members, characteristics, and outcomes of two transboundary structures.

There are several key differences between the GOMC and the PSGB Task Force. First, the GOMC was created through the agency of middle management who recognized that their work was impeded by a lack of transboundary communication. This "bottom-up" approach allowed the challenges experienced by on-the-ground staff to be directly addressed by the GOMC. Conversely, the PSGB Task Force was incepted by high-level government officials, resulting in a "top-down" approach to the institution's structure. This left the PSGB Task Force unaware of the issues faced by managers and vulnerable to disruptive events like federal elections. Second, there was a distinct effort to collaborate on scientific endeavors and joint action plans in the GOMC that was notably absent in the PSGB Task Force. This variation in perspective is even reflected in the names of each institution. GOMC participants were driven by their desire to protect the entirety of the Gulf of Maine, while PSGB members were bounded by separate geographical locations (Puget Sound in the U.S., Georgia Basin in Canada). Finally, due to the collaborative approach taken by the GOMC, the initiative was able to secure stable funding through sister organizations in Canada and the U.S. The PSGB Task Force was never able to obtain reliable funding, further driving Salish Sea protection efforts back to their country of origin. In summary, the top-down inception, divergent scientific and policy agendas, and inconsistent funding in the PSGB Task Force were important contributors to the institution's disbandment, while the GOMC and its commitment to transboundary collaboration remains functional today.

Table 3.1 The origins, members, characteristics, and outcomes of the GOMC and the PSGB Task Force. Adapted from Wondolleck and Jaffee (2017).

	Gulf of Maine Council on the Marine Environment	Puget Sound Georgia Basin International Task Force
Origins	• Director of the Maine Office of Coastal Programs, David Keeley, recognized the absence of a forum that allowed for transboundary discussion between Canadian and American partners. • Formally sanctioned in 1989 by state and provincial leaders, the Council created the mission statement: "To maintain and enhance environmental quality in the Gulf of Maine to allow for sustainable resource use by existing and future generations".	• As conflict surrounding sewage dumping and potential oil spills grew, government officials acknowledged that a cooperative approach between Canada and the U.S. to improve water quality in the Salish Sea was required. • Through the signing of the Environmental Cooperation Agreement in 1992 by BC Premier Harcourt and Washington state Governor Gardner, the Environmental Cooperation Council (ECC) was formed. • To implement the recommendations brought forth from a science panel commissioned by the ECC, the Task Force was created.
Members	• Three representatives from each of the listed states or provinces were appointed by their respective governor or premier: States of Maine, Massachusetts, and New Hampshire; Provinces of Nova Scotia and New Brunswick. • In 1995, additional representatives were added from federal agencies.	• Co-chaired by the BC Ministry of Environment and the Puget Sound Water Quality Authority. • Other representatives included Canadian and American federal agencies, Washington state government departments, fisheries commissions, and First Nations leaders.
Characteristics	• Created via a bottom-up approach through the initiative of middle management, building internal resistance to disruptive events such as elections. • Additional science initiatives, such as the Gulf of Maine Ocean Observing System, created a shared working knowledge of the region and its challenges. • Members were united by their "passion for the Gulf of Maine" and sense of regional identity. • Issues of importance were decided on by members and promoted the creation of joint action plans. At the center of all discussions was the health of the Gulf of Maine. • While participation was voluntary, representatives were appointed to the GOMC. This allowed for member participation to benefit both Council and individual organizations or agencies.	• Created via a top-down approach by elected government officials in provincial and state departments. When elections or other disruptive events took place, new individuals and priorities were thrust upon the Task Force. • Scientific data were generated on each side of the border, so no collective understanding of ecosystem needs, and threats was ever established. • Incepted prior to the unification of Salish Sea, the Task Force was named and operated based on two separate geographical areas: the Georgia Basin in Canada and Puget Sound in the U.S. • Issues of importance were tabled to discuss joint strategic planning. Without a set of concerns that were agreed upon by all parties, strategic planning never led to meaningful action. At the center of all discussions was finding a way to work together.

	• To manage finances, diverse funding sources were obtained and sister organizations on each side of the border were created.	• While participation was voluntary, overlapping structures within the Task Force created confusion and overwhelmed participants. • Attaining funding for transboundary projects and meetings was nearly impossible and discouraged collaboration.
Outcomes	• The GOMC still exists and is functional today. Current initiatives include marine debris, climate change, habitat restoration and spatial planning programs.	• The Task Force has been disbanded and the ECC has been restructured. While other forums have been created in its place, similar challenges to the ones faced by the Task Force prevent effective collaboration. These structures, too, seem to be waning and in danger of disbandment.

3.3 Study Setting

This research, while conducted virtually from Montreal, Quebec, surveys the SRKW policy actors in the Salish Sea region. The Salish Sea, roughly 18,000 km^2 in size, is composed of three distinct geographical areas: Puget Sound, Strait of Georgia, and the Juan de Fuca Strait. As of 2010, the three areas were collectively renamed the Salish Sea to celebrate local Indigenous heritage and to honor the Coast Salish people that have lived on its shores for thousands of years (CBC, 2010; Heasley and Macfarlane, 2016; Tucker and Rose-Redwood, 2015). The Salish Sea is fed by several major rivers including the Fraser, Squamish, Skagit, and Snohomish, all of which are important water systems for breeding salmon and other fish species. Figure 3.1 is a map of the region.

The Salish Sea hosts a multitude of ecosystem habitats including kelp forests (Hollarsmith et al., 2022), sea grass beds (Hessing-Lewis et al., 2018), and rocky intertidal zones. These different environments are critical for many fish, invertebrate, sea bird, marine mammal, and micro-organism populations. However, some of these habitats are greatly affected by human activities. Major ecosystem concerns include a growing population, potential oil spills, the mass dumping of sewage from coastal cities, and habitat pollution from shipping vessels and agricultural runoff (Gaydos et al., 2008).

Approximately 8.7 million people live in this area, with the population expected to exceed 10 million by 2040 (Environmental Protection Agency, 2021a). Shipping and transport are key industries, welcoming cruise ships, ferries, oil tankers, and container and cargo carriers from domestic and international destinations. It is estimated that 11,000 vessels transit the sea annually (Georgia Strait Alliance, 2021). The Salish Sea hosts two major port cities, Vancouver and Seattle, and many smaller ports in municipalities such as Victoria, Tacoma, Everett, and

Figure 3.1. A map of the Salish Sea region. Image from the Nature Conservancy of Washington, washingtonnature.org.

Bellingham. Tourism, fishing, energy, and forestry are also powerful economic drivers for the region, highlighting the significant contribution of natural resources to the local economy. In

2000, the American Environmental Protection Agency and Environment and Climate Change Canada created the Joint Statement of Cooperation to protect and preserve the Salish Sea ecosystem. One of the ten indicators used to evaluate the health of the Salish Sea is the number of marine species at risk. There are more than 120 endangered marine species, with the total number of species at risk doubling between 2002 and 2015 (Environmental Protection Agency, 2021a). Overfishing, pollution, climate change, habitat loss, and acoustic disturbance were cited as major reasons for species decline (Environmental Protection Agency, 2021b).

3.4 Methods

I used an exploratory case study research design to examine the transboundary SRKW governance network, as outlined by Yin and Campbell (2018). This research draws on qualitative key informant interviews and quantitative survey methods to describe and investigate the factors affecting the collaborative performance of this network.

3.4.1 Case Study Research

Yin and Campbell (2018) define case study research as "an empirical method that investigates a contemporary phenomenon in depth and within its real-world context, especially when the boundaries within the phenomenon and context may not be clearly evident" (p. 14). Put differently, case studies use a variety of approaches to explore complex phenomena (Gerring, 2007). Case studies have two distinctive components: the object, or the "analytical or theoretical frame" by which the research is bound, and the subject, or the "practical unit" on which the study is based (Thomas, 2011).

A case study methodological approach was appropriate to answer my research question due to the highly contextual nature of transboundary NRM. A case study approach was necessary to capture the nuanced interactions among actors within a single bounded context. As no one-size-fits-all solution exists to address NRM issues, practical management recommendations need to be tailored to the setting in which a network operates. For instance, the collaborative governance challenges faced by Atlantic fisheries (Flye et al., 2021) are not the same as those identified in the Great Lakes (Song et al., 2019). Therefore, a case-specific analysis is necessary to adequately address management concerns. The SRKW transboundary governance network is no exception. While previous case studies in the region have followed the journey of individual whales (Knoth, 2019), the entirety of SRKW transboundary governance network remains undocumented. As no such literature exists on the collaborative recovery of any endangered marine mammal, an exploratory approach permitted our data to shape our analysis.

Critics of case study research suggest that this methodological approach lacks rigor due to its flexible and adaptable nature (Thomas, 2011). To combat these concerns, Baxter and Jack (2008) recommend a research objective and design that maintains internal consistency. Additional strategies that lend credibility to findings, such as triangulation, or the use of multiple testimonies or sources of information, were employed.

3.4.2 Data Collection

Qualitative data collected in this project were obtained through key informant interviews with members of the SRKW transboundary governance network. Interview-based data collection took place between April and September of 2021. I conducted a total of 32 interviews, all of which occurred virtually due to COVID-19 pandemic restrictions. The interviews were semi-structured, allowing for open dialogue between the researcher and the participant. A list of pre-

tested interview questions (Appendix 2) served as the backbone for conversations, but this interview format allowed participants to elaborate on topics they deemed to be salient (Longhurst, 2003). Kallio et al. (2016) suggest that the semi-structured interview format can increase objectivity, and therefore, increase the validity of findings. The interview process was concluded when theoretical saturation was achieved (i.e., no, or very little, new information emerging from additional interviews).

To identify relevant stakeholders as potential participants, several purposive sampling approaches were used in conjunction. First, I consulted with colleagues in the SRKW governance network to determine important contacts. Next, I explored pertinent literature to find authors, meeting attendees, and event organizers. Email invitations were sent to this initial pool of prospective respondents. Once interviews had begun, some additional participants were identified via snowball sampling, a strategy in which participants refer the researcher to other relevant actors in the network. Mosley (2013) asserts that snowball sampling allows the researcher to access otherwise concealed individuals. Respondents came from diverse backgrounds within the SRKW governance network, spanning local, state, and federal governments, industry, NGOs, and scientists. The only major group that was not engaged were Indigenous communities. Technological community capacity, a short interview time window, and COVID-19 safety protocols were reasons for this situation, however, I sought to include relevant information concerning Indigenous groups from interview data.

In addition to interview data, quantitative survey data were collected. Survey invitations were sent via email to a list of potential respondents. Email addresses were obtained from email lists from previous surveys, public meeting minutes, agency websites, and groups identified through interview sampling approaches. The survey was built using Qualtrics software through

the University of Texas Rio Grande Valley. My SRKW survey data are a sub-sample of a larger Salish Sea fisheries project. Survey questions were selected from relevant literature (Song et al., 2019; Zhang and Li, 2015; Zhang and Qian, 2017) to target different dimensions of trust and perceived risk. The survey was pre-tested by network actors that did not participate to ensure optimal length, logical flow, and question validity. Survey data collection ran from November 2021 to February 2022. All methodological protocols were approved by the McGill University Research Ethics Board (21-04-0128) before data collection.

3.4.3 Data Analysis

Key informant interviews were transcribed using Express Scribe Transcription software. These data were then organized and coded following the recommendations of Miles and Huberman (1994). First round coding inductively explored common themes emerging from the data using a thematic analysis as outlined by Clarke et al. (2015): "a method for identifying and analyzing patterns of meaning in qualitative data" (p. 297). Second round coding was guided by the first two stages of collaborative governance, and their respective properties, as identified by Tonelli et al. (2018). All coding was completed in MAXQDA analysis software.

To investigate the interactions between various dimensions of trust, control, and perceived risk in our data, I pattern match findings with the anticipated relationships between the concepts within the collaborative inter-organizational alliance networks as predicted by Das and Teng (2001) and Hickey et al. (2022) (see Figure 2.1). Sinkovics (2018) defined pattern matching as "the comparison of a predicted theoretical pattern with an observed empirical pattern" (p. 469). My results, as they relate to pattern matching, were summarized in matrices to

easily compare data. Survey data were collected and organized in Excel. Basic summary and descriptive statistics were also performed in Excel.

To find the general levels of trust and perceived risk as reported in our survey sample, I averaged survey response data across all dyadic questions responses from a single agency type targeting specific trust or perceived risk type. Each dyadic question required a Likert scale response from 1 to 5 ranging from “strongly disagree” to “strongly agree” to gage respondent’s agreement with the statements presented. Affinitive trust, rational trust, and perceived regulatory risk had two questions per type, and perceived relational and performance risk had three questions per type. Table 3.2 is a list of the dyadic survey questions that had scores averaged for analysis.

Table 3.2 Dyadic survey questions. Survey questions required a 1 to 5 Likert scale response from "strongly disagree" to "strongly agree". Likert scale scores from all respondents from a single agency type were averaged.

Concept Targeted	Dyadic Question
Affinitive Trust	Because we have been working with this organization for so long, all kinds of procedures have become self-evident.
	In our relationships with the people in this organization, informal agreements have the same significance as formal contracts.
Rational Trust	This organization can be relied upon to perform its objectives.
	In our relationship with this organization, both sides treat each other in a consistent and predictable manner.
Perceived Relational Risk	People in this organization may break promises.
	The relationship with this organization will deteriorate in the foreseeable future.
	People in this organization will take advantage of us when the opportunity arises.
Perceived Performance Risk	The performance of this project is likely to decline in the foreseeable future.
	Our objectives in the fishery management project with this organization will not be achieved.
	This organization has no ability to offer us support when faced with difficulties in the management of this fishery.
Perceived Regulatory Risk	In opposing this organization, we would be negatively affected in the future.
	The actions of this organization may expose my organization to additional regulations if relevant rules are not followed.

3.5 COVID-19 Pandemic

The entirety of this research took place during the COVID-19 pandemic. This period was characterized in British Columbia and Washington state by lockdowns, mask and vaccine mandates, heightened public fear, non-essential business and service closures, and requirements for many employees to work from home. In this section, I present a general overview of major events in both British Columbia and Washington and the potential impact of these events on this thesis.

In March of 2020, both the British Columbia and Washington state government issued recommendations that members of the public stay home whenever possible (Canadian Institute for Health Information, 2021; Kershner, 2020). These orders stated that non-essential persons should work from home, thus spawning a massive migration of the North American workforce out of the office and into the virtual world. Working from home also largely discouraged regional and international travel. At the beginning of data collection for this research, COVID-19 vaccines in both Canada and the U.S. were available to persons 40 years and older. By July of 2021, anyone over the age of 18 could receive a vaccine in both jurisdictions. Stay-at-home and travel restrictions were also relaxed during data collection months in British Columbia and Washington due to low COVID-19 case counts and an increasingly vaccinated population.

The societal shifts resulting from the presence of COVID-19 and its respective health orders undoubtedly changed the way in which the SRKW governance network conducted their work, and by extension, my research findings. All data collection, both interview and survey, was conducted virtually. While online interviews were generally productive, some additional aspects of qualitative data collection were compromised. For instance, I was unable to enter the workspaces of SRKW governance network actors and could not collect valuable observational

data. Survey data were largely unchanged from non-pandemic conditions, as the survey would have been designed and delivered virtually irrespective of COVID-19 restrictions. Some interview questions were specifically designed to explore organizational COVID-19 adaptions to new work circumstances (see question 9, Appendix 2). My findings examine some COVID-19 related data to capture the circumstances of transboundary SRKW governance network during this time. As new information regarding the social, political, and economic changes that took place during the COVID-19 pandemic becomes available, additional reflections can be made on the way that such large-scale phenomena impacted my research.

3.6 Limitations and Assumptions

While useful and appropriate for case study research, the application of purposive sampling strategies has the potential to introduce bias. To address the issue of internal validity, I engaged participants spanning across stakeholder groups to ensure multiple perspectives were considered in both our survey and interview data (Weiss, 1995). I cross-referenced our qualitative and quantitative findings to confirm consistency across various dimensions of trust, control, and perceived risk. I minimized concerns of construct validity by creating my interview guide and survey with pre-tested questions adapted from those used by other scholars. My mixed-method study design allowed for the use of data triangulation to increase the reliability of my results.

Another limitation of my study is the bias caused by which individuals responded to our survey and interview invitations. Although I attempted to ensure that invitations were sent out to a wide range of stakeholders that would represent different perspectives across the network, I did not receive participation from all groups. For example, no interview or survey data from

Indigenous groups were collected. This lack of response from some key stakeholders and rightsholders was expected, as some methodological approaches do not necessarily align with the values of communities outside of academia or other Western institutions (Dion et al., 2020). Two other important stakeholder groups that did not participate in this study were the Canadian and U.S. navy, and key scientific organizations directly related to SRKW recovery. While multiple invitations were sent out to representatives from these organizations, no response indicating a desire to participate was received. To address the challenge of missing stakeholders in my survey, some questions were structured to collect dyadic data (e.g. the linking of two dyad members through the response of a single member (Frey, 2018)). In other words, I was able to collect some information about groups with low response rates through the responses of participants from other stakeholder groups. Nonetheless, I recognize that both my survey and interview findings inherently reflect the perspectives of network actors who had the time, inclination, and technological capacity to participate.

Finally, I acknowledge that I present most of the dyadic survey data by averaging Likert scale values. I believe that this was the best way to display generally reported network levels of trust and perceived risk. However, due to the uneven number of respondents between stakeholder groups, some of the averaged data represents the opinions of multiple participants and organizations, while other data reflects the perspectives of only a single actor or agency. Thus, I have chosen not to examine survey data on a dyadic level.

3.7 Research Gap

Although concepts of trust, control, and perceived risk have been used to examine the inter-organizational collaboration in transboundary NRM networks (Hickey et al., 2021), the

integrative framework has not yet been practically applied. Thus, my research introduces a novel way of conceptualizing collaborative performance in a transboundary species conservation network.

Previous research conducted in the Salish Sea region suggests that the challenges of transboundary governance are significant. For example, scholars like Emma Norman have been investigating the relationships between First Nations and non-Indigenous actors in the Salish Sea transboundary context for nearly two decades. Additional studies have explored transboundary SRKW recovery from governmental (Rehberg-Besler and Jefferies, 2019), industrial (Cominelli et al., 2018; Seely et al., 2017), and legal (Jefferies et al., 2021) perspectives, but descriptive network analyses and practical management recommendations remain absent from the literature. Consequently, my research investigates this context from a collaborative network governance perspective for the first time.

Chapter 4 – Results

In what follows, I present my findings in three parts. Section 4.1 is a summary of the interview and survey participants. In Section 4.2, I describe the transboundary SRKW governance network characteristics. This includes an analysis of major stakeholders, inclusive deliberative processes, and communication patterns in the network. I also incorporate findings regarding isolated dimensions of trust. In Section 4.3, I apply the integrated trust, risk, control framework presented in Figure 2.1 to explore the interactions between various aspects of trust, control, and perceived risk operating among organizations in the network.

4.1 Participant Demographics

Table 4.1 summarizes the number of respondents in each stakeholder group that were interviewed and participated in our survey. Table 4.2 reports the number of years each survey respondent reported working in the SRKW governance network. Additional information on participant demographics was collected but is not presented to protect anonymity.

Table 4.1 Summary of interview and survey participants by sector and number of participants per sector.

Stakeholder	Interview Participants	Survey Participants
Washington State Government	5	13
Canada Federal Government	3	5
U.S. Federal Government	2	3
Local Government	2	0
NGO	13	5
Business and Trade Groups (Transport, Tourism, Fisheries)	6	4
Binational Organizations	0	5
Scientists and Researchers	1	0
Totals	32	35

Table 4.2 The Number of Years that Survey Respondents have been Working in the SRKW Transboundary Governance Network.

Number of years working in the SRKW transboundary governance network	Number of survey participants
<1 year	2
1 to 5 years	8
6 to 10 years	3
11 to 15 years	6
>15 years	16

4.2 Network Description

Like many transboundary NRM networks, the SRKW governance network is diverse, spanning industry, multiple levels of government, NGOs, Indigenous communities, academics and researchers, and the public. Each organization has a unique role in the governance network that reflects its impact and responsibilities. For the purposes of this dissertation, I have condensed all agencies with similar roles into stakeholder groups. This is not to reduce the variability of organizational missions, cultures, or perspectives, but rather to describe broader stakeholder groups as they exist within and relate to the entire SRKW governance network. These features are summarized in Table 4.3.

As the most studied marine mammal on the planet (Pawluk et al., 2019), data on the SRKW is abundant. Most participants mentioned accessing SRKW demographic and ecological information through a variety of sources including scientific literature, social media, media press and news, Indigenous knowledge, and directly from experts.

Table 4.3 Summary of roles, responsibilities and key features of eleven major stakeholder groups.

Stakeholder	Findings
Federal Government – Canada	• Active departments: Fisheries and Oceans Canada (Fisher et al.), Transport Canada, Parks Canada, Environment and Climate Change Canada, Coast Guard • Legally mandated to protect SRKWs through the SARA • Manages fisheries, including Chinook salmon • Host Technical Working Groups (TWGs) and Indigenous and Multi-Stakeholder Advisory Groups (IMAGs) • Create and enforce distance guidelines for commercial and recreational vessels • Harmful chemical regulation and habitat decontamination • Outreach, education, and advocacy • Operating Marine Mammal Report Desk • SRKW research
Federal Government – U.S.	• Active departments: National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency, Navy, Coast Guard • Legally mandated to protect SRKWs through the Marine Mammal Protection Act and the ESA • Manages fisheries, including Chinook salmon • Host scientific SRKW forums, conferences, and events • Create and enforce distance guidelines for commercial and recreational vessels • Harmful chemical regulation and habitat decontamination • Outreach, education, and advocacy • SRKW research
Washington State Government	• Active departments: Fish and Wildlife (DFW), Department of Ecology, Puget Sound Partnership (PSP), Washington State Ferries, Salmon Recovery Office • Hosted Governor Inslee's Orca Task Force (2018-2019) • Implemented the Commercial Whale Watching Licensing Program • Harmful chemical regulation and habitat decontamination
British Columbia Government	• Active department: Ministry of Forests • Salmon habitat restoration
Local Governments	• Wastewater treatment • Salmon habitat restoration • Outreach, education, and advocacy

Indigenous Communities	• Hold important historical and behavioral information about SRKWs • Some nations have ancient familial bonds with SRKWs • Demonstrate sovereignty by expressing treaty rights and actively engaging in SRKW conservation [see Norman (2015)]
Public	• Recognize the SRKW as an important cultural icon for Salish Sea region • Participate in public hearings, sign petitions, write comment letters • Citizen science • Recreation
NGOs	• Outreach, education, and advocacy • Legal action and representation • SRKW research and vessel monitoring • Salmon recovery and habitat restoration • Participation in government and industry-lead inclusive deliberative processes
Academics and Researchers	• SRKW research • Knowledge dissemination
Tourism Industry	• Provide wildlife-viewing opportunities to members of the public • Collect information on whale location and behavior • Outreach, education, and advocacy • Support choice science organizations and initiatives with funding via donations
Fisheries Industry	• Organized into industry groups to represent interests, often divided by type or method of catch and nature of fishery • Potential for additional on-the-water SRKW data collection
Transport Industry	• Host voluntary programs to engage industry and foster communication (ECHO and Quiet Sound) • Engineer quieter and safer vessels for cetaceans • Research and recommend best practices for commercial fleets

However, the interpretation of the available data varied widely, resulting in divergent opinions across stakeholder groups. The single dominant controversy within the SRKW network is the value of whale watching. Critics of whale watching argue that the acoustic disturbances associated with tourism vessels are detrimental to the species, even if current distancing guidelines do not allow for whale watchers to seek out SRKWs directly. Proponents of whale watching advocate that data collection and wildlife viewing opportunities for the public are positive potential outcomes of the industry. With a fleet of almost 140 vessels (Shedd, 2019), the whale watching industry has become the target of a host of anti-whale watching campaigns. For example, in 2019, a 75-foot vessel painted red was sailed through the Salish Sea in protest of commercial whale watching activities (Victoria News, 2019). To further aggravate conflict, regulatory processes, such as the 2021 Washington state Commercial Whale Watching Licensing Program (Washington Department of Fish and Wildlife, 2021), frequently take place to discuss new, and often more restrictive, viewing guidelines:

> "Since the listing of the SRKWs, there have been multiple rulemakings. It seems like it comes up every 2-3 years, where new rules are being considered. It has been impossible to lay this issue to rest because the battle seems like it is constantly ongoing where there is one side fighting for a moratorium on whale watching and there is another side fighting for the value of having whale watching vessels out there. That has, at least over the last 15 years, been the most divisive issue [surrounding SRKWs] and the hardest one to get over." (U.S. NGO Employee)

Conflict surrounding whale watching appears to be deeply entrenched in the SRKW governance network. This ideological divergence is especially pronounced within the NGO

sector. Whale watching beliefs have such powerful implications that they appear to fully dictate whether organizations will communicate or collaborate, even on SRKW issues that are not related to whale watching. It can also result in personal attacks and strained relationships between organizations or individuals, many of which are decades old:

> "Because of my partnerships with other organizations that support whale watching, [I] came under personal attack by a few people… because they were very anti-whale watching… It affected my relationship with that particular organization and the individual that had done that. [When I] share that information with other partners, they by extension do not want to work with that other group. There is a little bit of a ripple effect there." (U.S. NGO Employee)

While these rifts appear to be a defining and limiting network characteristic, respondents identified strategies they use when attempting to mend damaged relationships or build new ones. Respondents employ activities that can "break the ice" between groups with differing opinions, such as passing along helpful information, striking up conversation at events, and organizing opportunities to meet. Participants mentioned that setting clear boundaries about which topics are on or off the table for discussion can allow disagreements about whale watching to be temporarily overlooked. These provisional "cease-fires" promote collaboration on issues that both parties agree on. Most groups, for example, seemed to share similar concerns for the lack of Chinook salmon availability. By pushing controversial issues to the side, groups that may disagree about whale watching reported collaborating on activities like signing comment letters, advertising for campaigns, or sharing data, credit, or resources with each other.

When individual attempts to initiate collaboration fail, formalized structures emerge to facilitate dialogue between organizations. The SRKW governance network hosts a variety of

these formal processes, which occur on both sides of the border with varying levels of success. There does not yet exist a forum that focuses on uniting transboundary SRKW recovery efforts. Some formal structures are highly contained and may only include members from one stakeholder group. Other forums are more inclusive and incorporate participants from a wider variety of stakeholder groups. Table 4.4 highlights three examples of formal structures created by government, NGOs, and industry generally considered successful.

Table 4.4. Summary of three successful inclusive deliberative processes, their inceptions and mission, outcomes, and supporting quotes.

Inclusive Deliberative Process	Inception and Mission	Outcomes	Quotes
Governor's Orca Task Force (2018-2019)	• Created by Washington state Governor Jay Inslee by signing Executive Order 18-02. • Intended to unite recovery efforts across state agencies, define SRKW threats, and engage external stakeholders.	• List of 49 recommendation for SRKW recovery. • Widely recognized as a successful forum by participants. • Creation of Orca Recovery Coordinator position to track recommendations and coordinate recovery actions across state agencies, and eventually, across all stakeholder groups.	*"The structure of [the task force deliberations] was there was a small table in the middle of the big ring of the task force. If you wanted to weigh in on an issue, you had to go to the small table in the middle [with a microphone] to have your face-to-face discussions. [This structure] worked really well because we could have these small conversations rather than try to have a talk with 44 people around a big circle. The conversations were real."* (U.S. NGO Employee)
Orca Salmon Alliance	• Consists of 17 organizations with the mission of protecting SRKWs through the recovery of Chinook salmon.	• Run Orca Action Month, an educational initiative that engages communities about salmon and orcas in the Salish Sea region • Write comment letters regarding proposed or current actions affecting SRKW.	*"The orca salmon alliance… has grown and changed a lot. We have added a lot more organizations. In some ways, that is a really good thing because we have more expertise. We are bringing in people with more experience and expertise with different issues. One of the reasons that we get together is to just let each other know what is going on… If there is an issue that comes up that requires public comment, for example, not everybody might know about it, so we inform each other about it."* (U.S. NGO Employee)
ECHO	• Launched by the Vancouver Fraser Port Authority in 2014. • Aspires to reduce underwater vessel noise, provide educational information to industry, and foster participation in research trials.	• Host voluntary ship slowdown measures in Haro Strait, Swiftsure Bank and Boundary Pass. • Conduct research regarding vessel-SRKW interactions and quiet vessel design. • Piloting the Strait of Juan de Fuca voluntary inshore lateral displacement trials, encouraging vessels to operate outside of key SRKW feeding areas.	*"One of the most successful collaborations I have seen in my life is the ECHO program… You are around a table that is full of industry, NGOs, regulators, First Nations… It was facilitated in such a way that everyone could come together to understand the problem first, understand the science, understand all of that, and then come to the table with an idea in a way that was in each individual's purview… ECHO is a great example of people being very transparent with each other and building trust with one another… ECHO is unique, in my experience."* (Washington State Government Employee)

Despite the presence of some successful formal structures to promote communication and collaboration, participants noted that the SRKW governance network faces barriers to creating and maintaining inclusive and deliberative processes. The first obstacle mentioned by respondents was that it is challenging to have all relevant stakeholders included in the deliberation process. Groups are rarely excluded purposefully but are sometimes forgotten or unable to attend due to time and resource constraints. For the most part, the network was viewed as learning from and addressing mistakes quickly by inviting missing participants and boosting their capacity to attend. Second, some respondents admitted to bypassing formal structures in favor of "back door" routes. These participants described the deliberative processes in place as slow and time consuming, instead opting to engage those in positions of political power to expedite their desired results. These alternative modes of action can sometimes occur at the expense of others and were viewed as detrimental to collaboration. Finally, respondents noted that "difficult" individuals and deliberative environments can hinder inclusive deliberative processes. When not designed or facilitated in a way that promotes respectful dialogue, some actors recalled being treated poorly by colleagues during formal events, effectively ending any proposed collaborative efforts: "The bullying tone that many of these groups use destroys and is corrosive to actual communication." (U.S. NGO Employee).

Nonetheless, participants mentioned some tools and techniques that have been employed to make inclusive deliberative processes more effective. Several respondents highlighted the importance of facilitation in deliberative forums and commended skilled mediators for creating respectful consensus-building spaces. Strong facilitators were seen as being able to strategically move dialogue away from highly contentious issues, such as whale watching, and direct discussions to less controversial topics where collaboration may be possible. In addition,

adequate documentation of meeting minutes and policies was noted as being essential for a clear record of events. The documentation of deliberative meetings was seen as promoting honesty and transparency, as well as serving as a reference for organizations that were not present to know what kind of issues and activities are being discussed at a network level.

In a transboundary network as large and complex as the one governing SRKWs, networking is an important activity that connects individuals and organizations. Since the ceasing of in-person events due to COVID-19 pandemic restrictions, the ability to network with others was reported to have significantly declined. Participants noted that virtual meetings allowed for the preservation of pre-existing relationships but did not easily facilitate the formation of new ones. The pandemic was reported to amplify the network's reliance on personal relationships built on affinitive trust and informal communication pathways. Respondents recognized that in-person activities are, however, essential to have informal, 'off-the-record' conversations. Participants noted that online meetings impeded their ability to read body language, ask questions, and respectfully challenge each other's positions. The virtual space has allowed some network actors to become more aggressive, especially when engaging with others through a chatroom or on a video call with their camera turned off. Nonetheless, virtual communication does appear to have some benefits. Respondents discussed the hypocrisy of working in an environmental field but having to travel long distances for meetings and conferences. Many were pleased to have a way to convene that does not have a significant carbon footprint or require travel time. Based on participant responses, a future hybrid model of virtual and in-person events is likely to be a successful compromise.

In the SRKW governance space, some types of information seem to flow easily between organizations. Educational initiatives, for example, appear to be readily shared across agencies.

The collaborative approach to SRKW advocacy was expedited when the ability to reach target groups, such as recreational boaters, was hindered by COVID-19. For example, in March of 2019, the Canadian federal government found many of its traditional communication channels with the public (i.e. radio, television) jammed by essential COVID-19 transmissions. Internal communication staff were also focusing on pandemic messaging, leaving Transport Canada employees unable to convey SRKW distancing guidelines to those on the water. Thus, the agency reached out to other stakeholders, such as NGOs and industry groups, to communicate on their behalf. These organizations had access to boaters through channels that were not bogged down by pandemic-related information, such as on-the-water vessel contacts and social media. Initial communication challenges were viewed as having resulted in meaningful innovation and potentially lasting partnerships between Transport Canada and the organizations it relied on in during that period.

However, not all information was reported to move through the network with ease. Research data, for instance, seems to be kept secretive, with data sharing inhibited by competition for resources and publishing credits:

> "Scientists, for example, often like to publish their work before sharing the data. Sometimes that publication process can be slow and drawn out. There could be useful data present and collected but not available for many years… In some cases, even after publication, people can be reluctant to share the data because it is so valuable." (U.S. Government Employee)

Without adequate access to current data, it is difficult for decision-makers to make scientifically informed choices, and eventually, build consensus around SRKW recovery measures. Compounding the stifled flow of SRKW data is the use of "one-way streets" –

demands from a more influential organization or stakeholder to obtain information from less influential groups. A few respondents emphasized the pressure they feel from larger groups to share information while receiving nothing in return. Coercion from more powerful actors can strain relationships between organizations and may hinder collaborative network performance over time.

In addition to the stifled flow of research data, participants shared other communication challenges. First, there appears to be a lack of clear communication pathways within and between stakeholders. The deficiency in direct information channels places a greater emphasis on the experience and interpersonal relationships available to actors.

> "I imagine what would happen if I left and got a different job tomorrow. A lot of those lines [of communication] wouldn't be clear to people… It's a lot of ad hoc… If somebody were to come in with no background, it would be really hard to recreate those pathways." (Washington State Government Employee)

This emphasis on informal communication flow puts network newcomers at a major disadvantage. Survey data indicates that nearly half of respondents had been involved in SRKW governance for more than 15 years, and thus, have had considerable time to build relationships with other actors (Table 4.2).

A second communication challenge reported for the SRKW governance network is a lack of delegated authority from superiors to pursue what respondents view as relevant tasks. This issue appears to be especially pronounced in large NGO organizations and government agencies where senior decision-makers are often not the ones participating in meetings, forums, or even SRKW recovery efforts. Lower-level staff expressed frustration with their inability to

communicate high-level organizational plans and sign off on projects, in addition to needing to wait for permission to proceed with daily tasks.

Using the survey data on network communication patterns, Figure 4.1 presents the frequently of communication across eight broad agency types from 206 dyadic data points. While the SRKW governance network description includes eleven stakeholder groups, the eight agency types present in Figure 4.1 reflect the groupings of Salish Sea fisheries at large, as determined by colleagues at the University of Texas Rio Grande Valley. Respondents could only select one organization per agency type or leave the response space blank, indicating that there is no communication between their organization and that respective agency type. As a result, organizational communication with multiple agencies within the same agency type are not captured. The agency group with the most recorded ingoing and outgoing communication selections was state and provincial government agencies. However, due to the governance structure of the U.S., we acknowledge that state authorities have significantly more influence in SRKW recovery than Canadian provinces. With strong relative connections to all groups except for business and trade groups, the Washington state government was a central hub of communication among survey respondents.

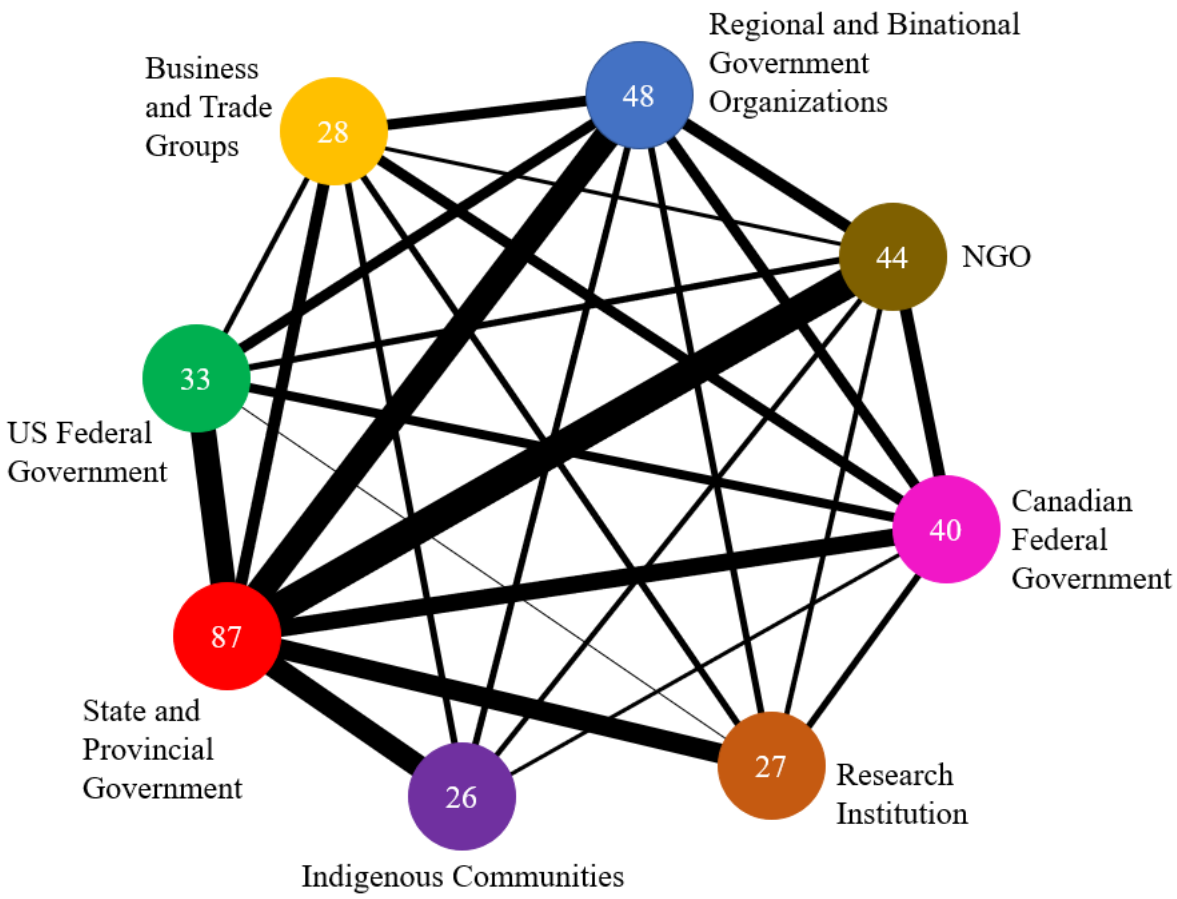


Figure 4.1 A map of communications between eight identified agency types. Line thickness indicates relative participant selection of the organizations within each agency type that they communicate with most frequently. The number inside each circle represents the number of ingoing and outgoing interactions as reported in survey data (n = 35). Recorded responses indicating communications within their own agency group were not mapped.

Survey data also shed light on general levels of affinitive and rational trust among a sample of actors working in the SRKW governance network. No dyadic measurements of procedural trust were included in our survey. Figure 4.2 summarizes average trust scores reported by respondents toward target agency types.

Based on survey responses, levels of affinitive trust levels were generally lower than for rational trust among the different actor groups in the network. However, interviews suggested that high levels of affinitive trust exist in smaller sub-coalitions and alliances within the transboundary network. For example, a U.S. NGO employee had this to say about their informal coalition:

"We are all working together, and we trust each other. We strategize together. We see things the same way. We're good sounding boards for each other…"

As effective and productive as these sub-alliances may be, they may contribute to network fragmentation. For example, respondents reported rarely interacting with organizations outside of their coalitions, unless in a formal deliberative setting. This scattering of sub-alliances does not promote affinitive trust at a network level, but rather reinforces the relationships, or lack thereof, already in place. Hypothesis 1 (Figure 2.1) suggests that by increasing network levels of affinitive trust, the perceived relational risk of collaboration can be reduced, pointing to a need for control mechanisms to support transboundary interaction and exchange. A lack of affinitive trust between organizations was found to be especially prevalent between NGOs where no legal mandates requiring cooperation exist. Differing positions on whale watching have stifled interaction within and between stakeholder groups, resulting in a low overall level of affinitive trust.

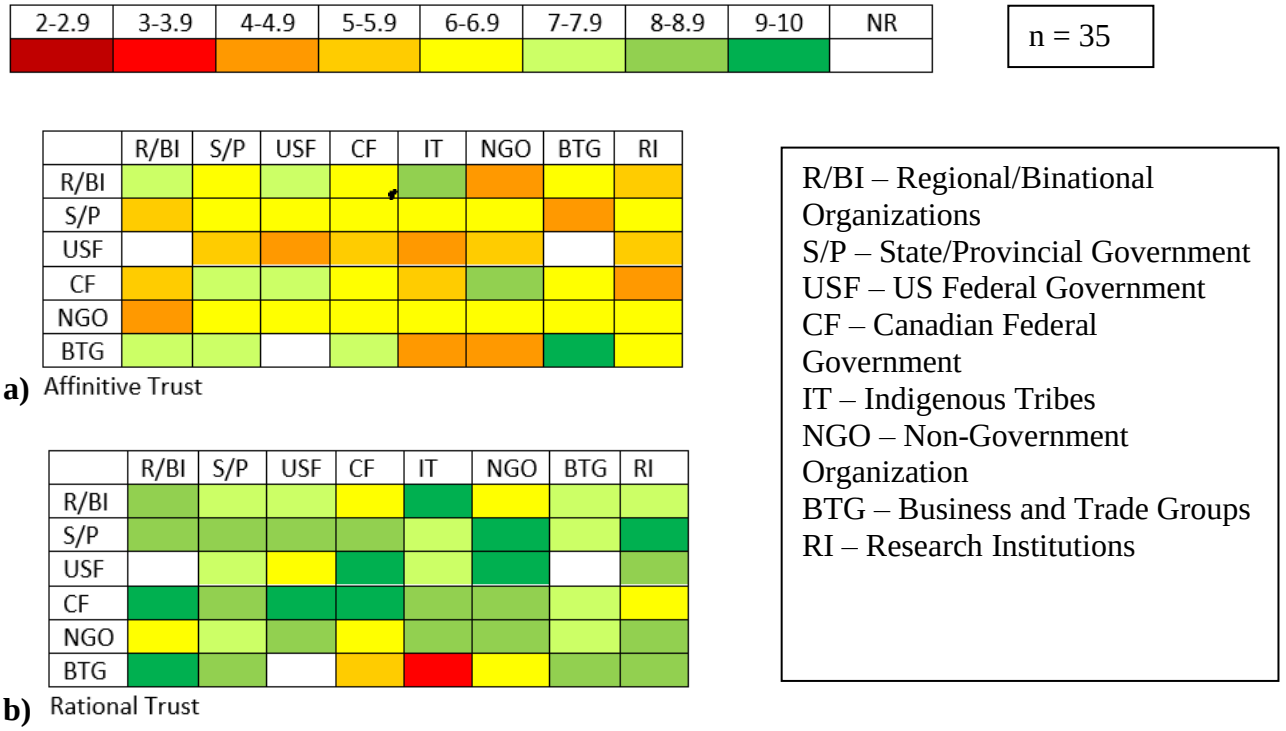


Figure 4.2 The average rating of a) affinitive and b) rational trust dimensions. Each trust rating was directed toward target agency groups reported by survey respondents (n = 35) working in the SRKW transboundary governance network. The left column indicates the respondent's home organization, and the top row indicates the agency group that they are targeting. Color codes indicate the averaged value of survey responses. Green coding indicates high trust scores, while red coding indicates low trust scores, existing on a scale from 2 to 10. White coding (NR) indicates no dyadic data collected between agency types.

Figure 4.2b shows that the survey respondents reported moderate levels of rational trust in their interactions with other network actors. As rational trust relates to an individual's or organization's competency, there is minimal interaction expected with affinitive trust. One can dislike the person that they work with and still believe that they can be trusted to carry out a task successfully. A moderate level of rational trust is to be expected, as many respondents had been working in the SRKW governance space for an extended period. Furthermore, most individuals working in species conservation in Canada and the U.S. are likely to be college educated with sufficient knowledge and training to fulfill their responsibilities. Therefore, it seems reasonable to trust that these actors have the relevant experience or skill set to complete their organizational or network duties, reducing the perceived performance risk of collaborating (Hypothesis 2, Figure 2.1). The key informant interviews reinforced this view.

4.3 Inter-organizational Collaboration in the SRKW Governance Network

Building from the general characteristics that define the SRKW transboundary governance network, I now explore the interactions between dimensions of trust, control, and perceived risk using the integrative framework presented in Figure 2.1.

Although the SRKW governance network currently displays low levels of affinitive trust and moderate levels of rational trust, previous research suggests that specific trust-building activities can combat these deficiencies. Prior to COVID-19, trust building activities were described as being more successful, as actors could meet face-to-face, have casual conversations, and get to know one another outside of work. Without these in-person meeting opportunities, network fragmentation appears to have become more prevalent since the pandemic began.

Table 4.5 summarizes the reported network trust building activities, their relation to levels of perceived risk, and supporting quotes from our dataset.

Affinitive trust building activities operate in the SRKW governance network through inclusive deliberative processes with moderate success. Drawing on techniques such as facilitation and intentional forum structuring, trust building activities within the confines of these processes are generally positive and productive. Additional activities may occur within other network coalitions. However, outside of small pockets of affinitive trust, almost no affinitive trust building activities were reported to exist. Thus, to build affinitive trust across the network, actors must wait until they can participate in an inclusive deliberative process to engage in such activities.

Rational and procedural trust building activities were reported to not function as well as those that build affinitive trust. This finding may be partially due to the SRKW governance network already exhibiting generally moderate levels of these trust types. Upon further investigation, one potential trust building activity for rational trust is joint scientific research. The SRKW network struggles to collaborate on research efforts because of competition for resources and credit. Therefore, it is necessary to address underlying concerns of data secrecy before such an activity can become possible. Because the SRKW is a highly endangered species, procedural trust building activities were reported to be negatively impacted by constantly changing rules and guidelines that reflect species needs. The whale watching industry appeared to be the group that is the most impacted by such changes. Thus, industry may become distrustful of governments and other stakeholders, making effective procedural trust building activities more difficult to implement. Low levels of network procedural trust may be partially responsible for high levels of perceived regulatory risk in the survey data (Hypothesis 3, Figure 2.1).

Table 4.5 The reduction of perceived risk through trust building activities in the SRKW transboundary governance network. Findings are colour-coded to reflect the functionality of each activity at a network level: green indicates the activity is functioning well and reduces one or more types of perceived risk; yellow indicates that the activity is partially functional and moderately reduces one or more types of perceived risk; red indicates that the activity is non-functional or absent and does not reduce any type of perceived risk. Italicized findings discuss anticipated perceived risk reduction per trust building activity compared to actual levels of perceived risk reduction in this network. Adapted from Hickey, et al (2021).

Trust Building Activity	Findings	Quotes
Affinitive trust building		
Establishing mutual interests	• Establishing mutual interests has not been achieved as a network outcome, although such activities do exist in formalized coalitions and forums (e.g. ECHO, Orca Salmon Alliance). • Groups that have a history of interpersonal issues or organizational conflict remain as a barrier for establishing mutual interests across the network. • *This activity moderately reduces perceived relational and regulatory risk. No change to perceived performance risk is expected or observed.*	"We have a common goal, and it makes sense to pool information and work together on those things. I think that is really comes down to our values of what is important and what we are working on and what we think needs to happen to advocate for these whales. Those are the organizations that I have gravitated toward because it feels like we are working toward the same thing." "Because there has been so much attention on the SRKWs… there is bad blood between different stakeholders or different organizations. It can lead to one group refusing to come to the table with another group… It is really hard to get certain people at the table together to talk about the things that they agree on because of what has happened on the things that they don't agree on."
Individual and team-level trust	• Affinitive trust is most apparent between long-standing network participants and in geographically isolated areas, such as the San Juan Islands. • Participants noted that activities outside of work were essential for creating affinitive trust with individuals inside and outside of their organizations.	"There are a lot of organizations that are based in the San Juan Islands. [They] see each other casually… They run into each other in the grocery store or on the ferry… If you're not one of those organizations, it feels like you can still work with and get to know all of those folks, but it's a little more formal how that happens… You don't necessarily build the personal relationships as quickly, or in the same way as you do if you're in the same community."

	• *This activity moderately reduces perceived relational risk. No change to perceived performance or regulatory risk is expected or observed.*	
Rational trust building		
Joint scientific research	• Joint scientific research heavily impeded by concerns of data sharing, funding, and credit. • Government contracts tend to commission single organizations to collect data rather than support collaborative efforts between multiple organizations. • *This activity would be expected to reduce perceived relational and performance risk, but as this activity is functionally absent, there is no reduction of any kind of perceived risk.*	"I think there is basically three kinds of challenges: one is potentially competition for resources… A second one is disagreements on what is the correct course of action… There is also sometimes in science competition for credit and so people may be reluctant to share data, for example… which can be a challenge."
Procedural trust building		
Joint creation of policies and procedures	• Frequent changes to policies (e.g. whale watching, vessel distances) creates frustration and procedural distrust among industry. • Some respondents described being invited to discuss policies and procedures but felt that their input was rarely considered in the final decision. • *This activity would be expected to reduce perceived relational and regulatory risk, but poor activity functioning results in no reduction of any kind of perceived risk.*	"It's not enough to invite everyone to these meetings. All of these stakeholders need to actually have a chance to be heard and feel like what they're saying matters. We are certainly happy to continue to be invited to these things. But let us speak. Let us talk and make us feel like you are hearing us. That's kind of what's missing, and I think that that would go a really long way."

According to Das and Teng (2001), control mechanisms can be implemented to reduce levels of perceived risk between organizations, even in the absence of trust. Table 4.6 summarizes network control mechanisms, their relation to levels of perceived risk, and supporting quotes from our dataset.

Of the three control types, social control has the greatest effect on reducing relevant perceived risk types by increasing network levels of rational, affinitive, and procedural trust (Hypothesis 6, Figure 2.1). Like affinitive trust building activities, most social control mechanisms reported in the SRKW network have been implemented in deliberative decision-making processes. Through the discussion and establishment of a unified vision, the SRKW governance network can satisfy one of the key requirements of multi-actor collaboration – common goals across stakeholders (Tonelli et al., 2018).

Output control mechanisms were described as being moderately functional in the SRKW network, largely stemming from the success of Governor Inslee's Orca Task Force (2018-2019). For example, the creation of the position of Orca Recovery Coordinator set a precedent for network accountability, as its major role is to track progress on Task Force recommendations. Put another way, the Orca Recovery Coordinator essentially operates as an output control mechanism by monitoring SRKW recovery performance across multiple departments of the Washington state government. There is no Canada-U.S. equivalent for SRKW recovery. Other output control mechanisms, like funding structures, were described as being in direct conflict with creating a collaborative environment due to creating competition between organizations, ultimately decreasing levels of affinitive and rational trust, and increasing levels of perceived risk (Hypothesis 7, Figure 2.1).

Table 4.6. The reduction of perceived risk through control mechanisms in the SRKW transboundary governance network. Findings are colour-coded to reflect the functionality of each activity at a network level: green indicates the mechanism is functioning well and reduces one or more types of perceived risk; yellow indicates that the mechanism is partially functional and moderately reduces one or more types of perceived risk; red indicates that the mechanism is non-functional or absent and does not reduce any type of perceived risk. Italicized findings discuss anticipated perceived risk reduction per control mechanism compared to actual levels of perceived risk reduction in this network. Adapted from Hickey, et al (2021).

Control Mechanisms	Findings	Quotes
Behaviour control mechanisms		
Transparency and inclusivity	• Deliberative processes are generally inclusive of multiple stakeholders across the network. • Transparency noted as lacking in most collaborative efforts, apart from ECHO and some NGO forums. • *This mechanism moderately reduces perceived relational and performance risk. No change to perceived regulatory risk is expected or observed.*	"[Deleted organization name] do things in not a terribly transparent way. Our role has been one to react to what we observe as an unsuitable way to implement a management decision…The powers that be decide, at times, unilaterally, that we are going to do things this way because this is what we have decided without all the information at hand."
Reporting structures	• Governmental reporting structures confusing due to overlapping mandates between departments. • Participants stated that artificial divisions in government structure have made it more difficult to address SRKW threats holistically and in the context of the entire Salish Sea ecosystem. • *This mechanism would be expected to reduce perceived performance and regulatory risk, but poor mechanism functioning maintains high levels of perceived risk.*	"… In terms of submitting [serious incident] reports… DFO is actually not able to directly enforce. It is Transport Canada's mandate to enforce [distance guidelines], but Transport Canada doesn't have any type of field team, so DFO is the field team. It is a really challenging discrepancy because then DFO has to submit the evidence to Transport Canada and [they have] to take action."
Staffing and training	• Due to an emphasis on affinitive trust and informal communication pathways for this network to operate, actors mentioned staffing and training new employees to be a laborious task.	"Ideally, we would double or add more people to our program, but… It is easier said than done when you go to find the right people and build a team and build the program… It takes time for any new person coming into the program to learn the

	• Some respondents discussed a collaborative approach to staffing and training which would spread the workload of training new staff across the network and create stronger inter-organizational ties. • *This mechanism would be expected to reduce perceived relational and performance risk, but poor mechanism functioning maintains high levels of perceived risk.*	program, to be familiar with the relationships, and to get to know people." "[We are getting involved in] helping with training for other organizations and partners. I would also really enjoy being able to get that from other organizations. I would like to get know a little bit more about the other facets of this field of work."
Output control mechanisms		
Setting goals and objectives	• Governor's Inslee's Orca Task Force created a list of 49 recommendations for SRKW recovery, one of the best network examples of generating a clear and actionable set of objectives.	"What [we needed] to do was get as detailed as possible, so [we] knew who was accountable, what exactly they needed to do, and what success looks like. That way we are able to and continue to push under each of those 49 recommendations. We probably are actively working on 10 at a time. We actually know what needs to be done and we can point to the recommendation and get that work happening."
Monitoring and assessment	• Governor Inslee's Orca Task Force created the Orca Recovery Coordinator position to track progress on each of the 49 recommendations, constructing a new way to monitor and assess progress. No such equivalent exists within Canada. • *This mechanism is expected and observed to reduce perceived performance and regulatory risk.*	
Planning and budgeting	• The competitive charitable funding structure of non-profit organizations discourages collaboration across NGOs. • Government planning and budgeting is more accessible and transparent than other stakeholder groups. • *This mechanism is expected to reduce perceived performance risk, but poor mechanism functioning maintains high levels of perceived risk.*	"All those [funding] structures that we live within as charities are extremely challenging and they create communication problems because everyone is focused on getting funding for their work. Working together can be wonderful and great, but it can be problematic."
Social control mechanisms		
Decision-making process	• Actors noted skilled facilitation and adequate documentation are necessary for successful decision-making processes. • Barriers to the decision-making process include interpersonal difficulties, historical conflict between	"I also have enlisted help through a consultant firm to… facilitate meetings and… plan exercises to get through certain conversations… that has been tremendously helpful in getting people to think creatively about problems, move out their positions, be more collaborative, build relationships, build trust."

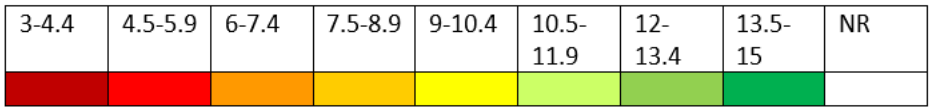
	organizations, incorrect or absent representation of relevant groups, and forgoing formalized structures for "alternative routes". • *This mechanism moderately reduces perceived relational and performance risk. No change to perceived regulatory risk is expected or observed.*	"We will typically try to operate through the expected and anticipated channels… However, sometimes, that does not garner the results we would hope. Then, we are left with the alternative to reach out politically or… to more senior levels of the bureaucracy… It has been effective to varying degrees."
Joint dispute resolution	• ECHO broadly recognized as a network leader in joint dispute resolution due to excellent facilitation and a culture of transparency, honesty, and science-based initiatives. • Actors noted that it was more common to not discuss contentious subjects with other individuals or groups rather than to attempt to resolve disputes. • *This mechanism is expected and observed to reduce perceived relational and performance risk.*	"I think through the Governor's task force, that was a very formalized process that was a facilitated process. I think similarly the ECHO program has a facilitated process, so kind of professional facilitators doing work… It can be helpful having that third party be there to act as someone who can, not be neutral necessarily, but… are somewhat removed from the issue. I think that otherwise it is really incumbent upon individuals…"
Meetings, events, conferences	• Meetings, events, and conferences have been highly affected by COVID-19 pandemic. • Prior to the COVID-19 pandemic, respondents discussed the success of region-wide conferences and workshops to bring different stakeholders together. This was especially prominent in the scientific/academic community. • Participants reported a general trend of having more meetings during COVID-19 due to the ease of using virtual platforms. However, respondents mentioned having too many meetings and "Zoom fatigue" as being negative effects of having more online meetings. • *This mechanism moderately reduces perceived relational risk. No change to perceived performance or regulatory risk is expected or observed.*	"Around the time of listing [SRKWs as endangered] and up through the development of the Recovery Plan, my agency hosted quite a number of workshops where we invited researchers both academic, other government, NGOS, other countries… We got everyone together… and had lots of presentations… and discussions about what were important research priorities... Those were particularly instrumental in the development of the Recovery Plan which includes a lot of prioritizations of research activities."
Ritual, ceremonies, and networking	• Rituals, ceremonies, and networking highly affected by COVID-19 pandemic. • Actors recognized networking opportunities as being fundamental for the formation of new relationships, but networking is not possible in the virtual landscape.	"[Networking] was more of an issue for newer people in the community who haven't done this work and may not have the network of people that I do. For them to forge new relationships on a 50 person Zoom meeting was just not going to happen."

	• *This mechanism moderately reduces perceived relational risk. No change to perceived performance or regulatory risk is expected or observed.*	

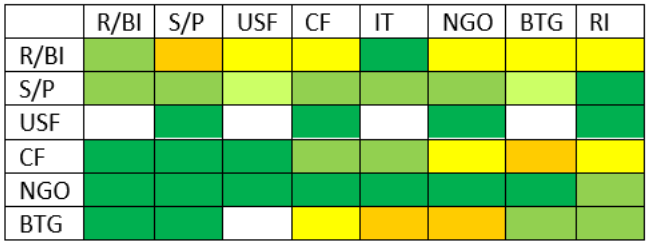
Behavioral control was described as the least successful control type in the collaborative governance network due to difficulties with enforcement that arise from a lack of cooperation. Artificial divisions that separate government into branches and inconsistent departmental mandates makes navigating the bureaucratic process exceedingly difficult: “To have that whole of government approach is really challenging. [The] mandates [of different government departments] are often in conflict with each other… Those are [communication] challenges for those departments.” (Canada Industry Employee).

Adequate training of new staff is another network challenge. As previously noted, the SRKW governance network relies heavily on personal relationships built on affinitive trust. Instead of leveraging these relationships to share training responsibilities across the network, current staffing strategies isolate network newcomers, decrease levels of affinitive trust and increase levels of perceived relational and performance risk (Hypothesis 7, Figure 2.1).

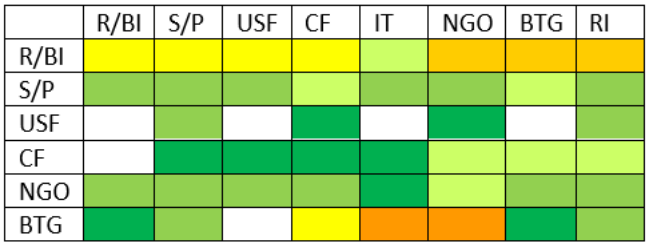
Figure 4.3 summarizes the average perceived risk ratings by target agency types using survey data. Respondents indicated low to moderate levels of perceived relational risk in their professional relations with other actors. Due to the endangered status of the SRKW, two key pieces of legislation come into play: the SARA (Canada) and the ESA (U.S.) (Olive, 2017). Both Acts explicitly state that the federal government of each country is required to cooperate with various agencies to address species conservation. While only governments must legally adhere to these Acts, the organizations with whom the government works with are also implicated in this policy requirement. There is therefore a basic understanding that governments, and by extension, the entire SRKW network, will need to collaborate with others to some degree to recover the species.



n = 33

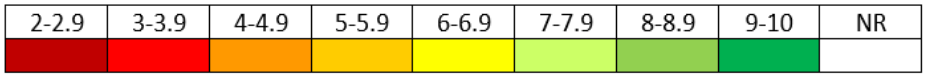


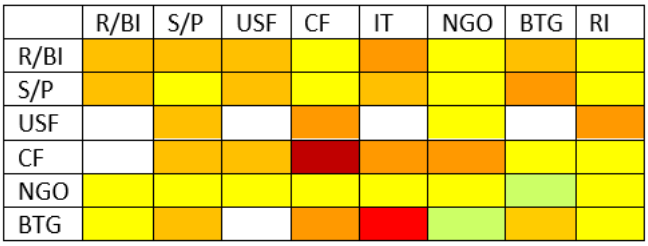
a) Perceived Relational Risk – reverse coded



b) Perceived Performance Risk – reverse coded

R/BI – Regional/Binational Organizations
S/P – State/Provincial Government
USF – US Federal Government
CF – Canadian Federal Government
IT – Indigenous Tribes
NGO – Non-Government Organization
BTG – Business and Trade Groups
RI – Research Institutions





c) Perceived Regulatory Risk – reverse coded

Figure 4.3 The average ratings of a) perceived relational risk, b) perceived performance Rrisk, and c) perceived regulatory risk dimensions. Each risk rating was directed toward target agency groups reported by respondents working in the SRKW transboundary governance network (n =33). The left column indicates the respondent's home organization, and the top row indicates the agency group that they are targeting. Color codes indicate the averaged value of survey responses. Green coding indicates high trust scores, while red coding indicates low trust scores, existing on a scale from 3 to 15 (a and b) or 2 to 10 (c). White coding (NR) indicates no dyadic data collected between agency types.

Our interview data suggest that this legal framework provides a clear expectation that working with others is an inherent part of species conservation and reduces the perceived relational risk of doing so (Hypothesis 9, Figure 2.1).

The survey data also indicate low to moderate network levels of perceived performance risk, a finding supported by interview data. Similar to overall rational trust levels, actors in the SRKW governance network have considerable experience and a high level of education that serve to reduce perceived performance risk. Furthermore, with more than $1.3 billion pledged between the Canadian federal and Washington state governments, and a substantial reserve of biological and ecological SRKW data, the transboundary governance network likely does not expect resource or information deficits to curb success. The ready availability of these assets, in addition to a competent work force, contribute to moderate levels of perceived performance risk (Hypothesis 10, Figure 2.1).

The survey data suggest the highest perceived risk type is regulatory risk. This may be in part due to the strong sanctions regarding activities that adversely influence an endangered species to be a defining network property. For the SRKW, any action that negatively impacts their food source or habitat has the potential to devastate the population. Thus, it may be risky for organizations to enter partnerships with those suspected of, or known to, violate rules, as the severe consequences for problematic behavior could be applied to all associated agencies. By working with rule-breaking organizations, actors put themselves at risk of being "guilty by association":

> "If you have a group, for example, that takes out a billboard that really criticizes one member of Congress, the groups that are in that coalition can pay the price of

that by that Congress member not being willing to meet with any of the groups, which is something that happened recently." (U.S. NGO Employee)

According to Hypothesis 9 (Figure 2.1), the implementation of effective behavior control mechanisms should reduce inter-organizational perceived regulatory risk.

Table 4.7 describes the interaction of various aspects of trust and control to explain observed levels of perceived risk based on the case study analysis. To illustrate how the observed SRKW governance network data compared to the hypothesized relationships between trust, control, and perceived risk based on Das and Teng (2001) and Hickey et al. (2022), I present a pattern matching matrix.

The results reveal nine interaction cells in which the SRKW governance network may benefit from further management attention. First, we find that existing behavioral control interactions with affinitive trust are not reducing perceived relational or regulatory risk of collaborating to the extent possible. I attribute this finding to the reported sub-optimal behavioral control mechanism functioning in support of transboundary collaboration (Hypothesis 9, Figure 2.1). A similar pattern with interactions between behavioral control and rational and procedural trust was also observed, leading to higher-than-expected levels of perceived performance and regulatory risk in relationships. These results further support the findings presented in Table 4.6.

Table 4.7. Perceived risk reduction through various trust and control types. Cells describe the level of perceived risk from the interaction between trust type and control mechanism. There are three types of perceived risk identified in the table: relational, performance, and regulatory. "Anticipated" columns reports idealized perceived risk values per interaction cell in collaborative network. "SRKW Case" column indicates the reported levels of perceived collaborative risk identified through interview and survey in the network. Levels of perceived risk are classified based on colour coding. Green cells indicate that there is a low level of perceived risk type; yellow cells indicate that there is a moderate level of perceived risk type; red cells indicate that there is a high level of perceived risk type; no colour indicates that there is no hypothesized relationship between level of perceived risk and trust and control type interaction. These differences highlight the areas in which control mechanisms fail to reduce perceived risk type to levels expected in an "Anticipated" collaborative network. Adapted from Das and Teng (2001).

	Behaviour Control		Output Control		Social Control	
	Anticipated	SRKW Case	Anticipated	SRKW Case	Anticipated	SRKW Case
Affinitive Trust	*Relational*	*Relational*	*Relational*	*Relational*	*Relational*	*Relational*
	Performance	*Performance*	*Performance*	*Performance*	*Performance*	*Performance*
	Regulatory	*Regulatory*	*Regulatory*	*Regulatory*	*Regulatory*	*Regulatory*
Rational Trust	*Relational*	*Relational*	*Relational*	*Relational*	*Relational*	*Relational*
	Performance	*Performance*	*Performance*	*Performance*	*Performance*	*Performance*
	Regulatory	*Regulatory*	*Regulatory*	*Regulatory*	*Regulatory*	*Regulatory*
Procedural Trust	*Relational*	*Relational*	*Relational*	*Relational*	*Relational*	*Relational*
	Performance	*Performance*	*Performance*	*Performance*	*Performance*	*Performance*
	Regulatory	*Regulatory*	*Regulatory*	*Regulatory*	*Regulatory*	*Regulatory*

Chapter 5 – Discussion

This research is the first to apply the multi-dimensional concepts of perceived risk, trust, and control to transboundary governance in the Salish Sea region or endangered species conservation. Through key informant interviews and survey data, the factors affecting the collaborative performance of the transboundary network governing the SRKW is evaluated. The results describe a governance network that is fragmented by jurisdiction, social expectations, confusing communication channels, and competition for resources, requiring careful management attention. Indeed, it appears that the necessary pre-collaborative environment may be missing for transboundary management success in this context. In what follows, I consider this observation, expand on key findings, consider implications for other transboundary species conservation networks, and identify future research directions.

5.1 Pre-Collaborative Environment in the Salish Sea Region

According to Ansell and Gash (2007), the pre-collaborative environment can have great influence, both positive and negative, on a network's collaborative performance. Given that the SRKW transboundary governance network has not yet achieved a fully collaborative state, we must first look to any antecedents of collaboration yet be fulfilled. Based on the case study analysis, I identify two collaboration antecedents fully or partially absent from the SRKW governance network. First, there is a deficiency in facilitative transboundary leadership. Effective network leaders are individuals who act in the interest of collaborative governance. They need not wear a manager's hat to be successful. Rather, they are "neutral citizens" and can occupy any number of positions in a governance network (Ansell and Gash, 2007).

The SRKW governance network is not void of strong leaders. The heads of major network events, such as Governor Jay Inslee, and the teams driving successful inclusive deliberative programs, like ECHO, were described as powerful trailblazers that possess key leadership characteristics. The kind of facilitative leadership currently lacking are boundary spanners. According to Williams (2011), boundary spanners are "a set of individuals who have a dedicated job, role, or responsibility to work in a multi-agency and multi-sectoral environment and to engage in boundary-spanning activities, processes and practices" (p. 27). In other words, boundary spanners are people who, when placed in the right positions, have the correct set of skills and characteristics to connect people across boundaries to one another.

Those that occupy the role of boundary spanner rely heavily on interpersonal abilities to build and maintain connections across organizations (Williams, 2002). In fragmented networks like the one governing the SRKW, these individuals can play a key role in fostering collaborative efforts across organizational or jurisdictional boundaries by planning informal interactions, and advocating for fair, transparent, inclusive and consensus-driven deliberative processes (Coleman and Stern, 2018a). In addition to their role as an output control mechanism, an example of a boundary spanner in the SRKW case is the Orca Recovery Coordinator. This role was created to serve as an in-house boundary spanner, connecting individuals across various departments of the Washington state government. However, this role does not address the Canada-U.S. collaborative relationships, nor the relationships between state and non-state actors across the region. There appears to be an opportunity for additional boundary spanning roles to be created to close the gaps between organizations and countries involved in the SRKW network.

In some cases, the role of boundary spanner can be played by an organization rather than an individual. Guston (2001) notes that boundary spanning organizations recognize and create

standardized boundary objects, or information that may be used differently across groups. By generating a singular and shared understanding of a boundary object, boundary spanning organizations can engage participants that may fall on either side of a boundary. For example, the Puget Sound Institute at the University of Washington acts as a boundary spanning organization by synthesizing scientific data in ways that are comprehensible to decision-makers across stakeholders. However, the Puget Sound Institute only engages with SRKW policy indirectly and, due to funding and mandate structures, does not operate as a transboundary agency. While this organization serves a useful function on the U.S. side of the border, the need for similar boundary spanning organizations to operate across the Canada-U.S. jurisdiction remains.

A lack of preliminary rules structuring the SRKW governance network was also observed in the data. Preliminary rules are the founding principles of how a network chooses to operate. Freeman (1997) posits that these rules can be changed as needed to fit the demands of the network. Among this code of conduct should be descriptions of each member's role, so actors know which network duties they are responsible for (Foster-Fishman et al., 2001). Most formal deliberative processes in the SRKW governance network have successfully created guidelines and expectations that all actors must adhere to if they wish to participate. Outside of these highly regulated forums, the rules governing the interactions of this network become unclear. Enhancements to existing behavioral control mechanisms may help to create the necessary guidelines to govern transboundary conservation and species recovery relationships.

5.2 Improving Collaborative Performance in the Transboundary SRKW Governance Network

There are several findings regarding collaborative performance that I believe merit further discussion. In this section, I consider ways to address network conflict regarding the whale watching industry, how to overcome policy differences between jurisdictions, and how to manage information at a network level and in a transboundary setting.

While the data demonstrate that meaningful collaborative relationships exist throughout the Salish Sea, these relationships cluster around sub-alliances and coalitions rather than spread across the entire network. Due to divergent opinions on controversial topics, the relationships an actor can build are largely dictated by who holds similar perspectives to them, and who does not. Social control mechanisms, such as those that foster casual, off-the-record discussions can influence goal consensus (Song et al., 2019) and facilitate coordination (Temby et al., 2017). Thus, I expect that creating more opportunities to informally engage network members with different viewpoints may allow for new relationships to form. However, it is important to acknowledge that the COVID-19 pandemic had a notable impact on this network property due to a lack of in-person meeting opportunities, affecting study results.

The SRKW governance network appears to struggle with fostering inter-organizational collaboration across the international border. One barrier requiring attention is that the policies and institutions that exist in Canada and British Columbia are fundamentally different from those in the U.S. and Washington. Although both the *SARA* and the *ESA* were written with the intent to protect each country's threatened flora and fauna, the way in which these Acts are applied makes cross-border species protection challenging (Olive, 2017). According to Liu et al. (2020), the variance of policies across jurisdictional borders diminishes a network's transboundary

collaborative performance. A potential solution could include the creation of protected areas that cross international borders. These zones need not adhere to existing policies, but instead can be governed by a new set of rules agreed upon by all jurisdictions. There is also a need to look more closely at successful cases of transboundary collaborative species conservation for guidance. By modelling transboundary institutions to resemble those that function effectively, it may be possible to overcome previous or unknown collaborative barriers. For instance, the Gulf of Maine Council on the Marine Environment may offer inspiration for future transboundary structures in the Salish Sea.

Transboundary information flow is another challenge facing the SRKW governance network. Knowledge management is a property of collaborative governance networks, which rely on communication and information sharing (Tonelli et al., 2018). Although the terms data, information, and knowledge maintain distinct, yet related, definitions (Hatala and George Lutta, 2009), we use all three terms interchangeably here. A network that operates with a shared knowledge base will be better able to generate discourse and align viewpoints (Stahl and Hesse, 2009). Burk (1999) argues that there are four parts of the knowledge management cycle: creation, organization, sharing, and application or reapplication. The multi-level SRKW governance network appears to create, organize, and apply data effectively. The knowledge management cycle breaks down in its third step – sharing. According to Bock and Kim (2002), external rewards for sharing knowledge have little influence on attitudes toward knowledge sharing. Instead, they posit that creating positive views about the sharing of information is more likely to influence intentions and behaviors.

It is also important to consider knowledge management within the transboundary context. Knowledge gaps exist throughout the SRKW network between jurisdictions and organizations.

In some cases, information is kept secretive for reasons beyond that of species recovery. For example, according to one respondent, publicly available hydro-acoustic data collected on Salish Sea orcas must first be scrubbed by the Canadian navy to conceal any information that may compromise national security. In other instances, knowledge gaps exist due to unidentified missing information and knowledge incompatibility. Milman et al. (2020) offer that creating comprehensive knowledge inventories and reconciling divergent understandings of information may help close these knowledge gaps. If the transboundary SRKW governance network wants to further promote the sharing of information among its members, new social control mechanisms should be explored to make the distribution of knowledge a network norm.

5.3 Relevance to Transboundary Species Conservation Policy

Current political boundaries have carved up Earth's surface into 195 different countries, each with their own set of internal borders. The home ranges of many plant and animal species cannot neatly fit within these arbitrary geopolitical confines. Thus, we are faced with a mess of our own making – how can we protect species that do not recognize human boundaries?

While this thesis documents the case of the SRKW, it is important to note that the failure to protect a species due to insufficient collaboration across jurisdictions is not unique. Transboundary wildlife conservation challenges exist around the globe - in other parts of North America (Middleton et al., 2020), South America (Lambertucci et al., 2014), Europe (Linnell et al., 2016), Asia (Mason et al., 2020), Africa (King and Wilcox, 2008) and across the Arctic (Aho and Meek, 2020). However, the story of the SRKW is distinct in a few important ways. First, the SRKW is not hunted. Many species of whale and other large mammals are killed to support local populations that rely on their flesh, skin, and bones to provide food, clothing, and other

necessities. Aho and Meek (2020) describe the value of the bowhead whale to northern Indigenous communities and note that transboundary collaboration for the protection of this species is essential for the survival of traditional Indigenous ways of living. This is not to say that the SRKW is not of great importance to the Coast Salish and other Indigenous people, but they do not directly provide sustenance or material goods to these communities. Second, the SRKW comes under threat in a wealthy and peaceful part of the world. In her research on transfrontier conservation areas in South Africa, Duffy (2006) discusses the conflict between local communities that rely on the land for sustenance and larger neoliberal enterprises wanting to make the region an ecotourism 'hot spot'. While King and Wilcox (2008) propose that making conservation projects a public attraction can provide some economic incentive for transboundary cooperation, decision-makers must carefully consider how these projects will impact local communities. Furthermore, Mason et al. (2020) document how an absence of formal institutions in developing regions may serve as a barrier to transboundary cooperation. However, many areas that are technologically or institutionally restricted, such as the Arctic, are especially vulnerable to the effects of species extinction. Third, SRKWs are a well-studied species with ample ecological and biological data available. In other cases, such as that of the Andean condor of South America, little was known about the species that transboundary collaborative efforts aimed to protect until recently (Lambertucci et al., 2014). A wealth of knowledge regarding species needs is available to the SRKW governance network, allowing decision-makers to propose and implement scientifically informed policies. Fourth, the SRKW is a captivating species. Smaller, non-mammal species are not as readily protected as charismatic megafauna, and thus, are at a greater risk of extinction (Liu et al., 2020). Finally, the SRKW is a marine species that can swim across international borders easily. Land-bound species face human infrastructure challenges like

walls, fences, and busy roads. Liu et al. (2020) argue that developments that break landscape connectivity should be avoided at all costs to preserve natural migration patterns and ecological integrity. Terrestrial species open the conservation conversation to a larger audience which must balance species protection with issues of national security, transportation, and private land ownership.

This dissertation suggests that applying a multi-dimensional trust, control, perceived risk framework to analyze inter-organization collaborative performance across jurisdictions has value to transboundary conservation objectives. Although conservation management plans vary widely based on the needs of target species and local communities, the social and political environment, and the availability of scientific research, the need for collaborative governance will require a mix of trust, and control types to mitigate the perceived risks of organizations collaborating.

5.4 Future Directions

Future research could expand upon the ideas presented in this thesis by determining the extent to which various dimensions of trust, control, and perceived risk influence one another in transboundary environmental management. Additional areas identified for future research include:

- Documenting the interactions between the SRKW transboundary governance network and closely related networks, such as that of Chinook salmon, to place findings within a more holistic Salish Sea context. The SRKW shares the Salish Sea ecosystem with a diverse community of other vertebrates, invertebrates, and micro-organisms. The policies and actions of any Salish Sea NRM governance network may affect all species inhabiting the region and result in direct or indirect effects on SRKW recovery.

- Exploring the SRKW transboundary governance network from an Indigenous perspective. A limitation of this research is that there were no Indigenous participants in the key informant interviews or survey research. While I was still able to obtain data about organizational relationships with Indigenous groups, my results lack the Coast Salish point of view.
- Further investigation into the viability of different transboundary control mechanisms in the Salish Sea region to inform management strategies in the context of the SRKW governance network and beyond.

Chapter 6 – Conclusion

By assessing multiple dimensions of trust, control, perceived risk, and the interactions between these concepts, I have, for the first time, described and evaluated the factors affecting the inter-organizational collaborative performance of the transboundary SRKW governance network. As a highly endangered population, the survival of the SRKW depends on the successful collaboration of actors across diverse boundaries. Despite only 70 individuals remaining, SRKW cultural iconography unites the Salish Sea region and serves as an economic driver for the local tourism industry. To some Coast Salish peoples, the SRKW share familial ties and are considered ancestors in Indigenous histories. To the people of the Salish Sea, to lose the SRKW would be to lose a sense of place and purpose – such cultural value cannot easily be replaced.

What are the factors affecting the collaborative performance of the transboundary network governing the endangered SRKW? As in any complex system, one can expect a complicated answer to this question. This study has identified key shortcomings regarding transboundary network collaborative functioning between organizations and jurisdictions. Results suggest that informal social norms regarding whale watching and knowledge sharing are limiting factors of network collaboration. Ineffective behavioral and output control mechanisms also contribute to high levels of perceived collaborative risk across the network. There appears to be a need to integrate new control mechanisms into already successful inclusive deliberative processes across boundaries. Furthermore, recognition of the central role that the Washington state government plays in network-level communication should influence network information sharing and communication strategies moving forward. As a transboundary species, the implementation of effective SRKW recovery policies will require greater collaboration across

international and local boundaries. Such transboundary functioning is hindered by the lack of a formal boundary-spanning or coordinating institution to synchronize recovery efforts between Canada and the U.S. (Wondolleck and Yaffee, 2017), and between government and non-state actors, including Indigenous peoples.

Through the integrative consideration of trust, control, and perceived risk as inherent network properties, this thesis provides novel insights into the collaborative functioning of a transboundary NRM network. Using empirical case study methodology, the findings contribute to the growing body of transboundary collaborative governance literature through the exploration of recovery efforts for a highly endangered marine mammal. There is a need for new transboundary management control perspectives and mechanisms to support collaborative governance performance across the Salish Sea, while accounting for the different dimensions of trust, control, and perceived risk affecting the implementation of share conservation and management objectives.

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Appendix 1 – Participant Consent Form (Interviews)

Project title: Trust, control, and risk in the Salish Sea: A case study of the transboundary network governing the endangered southern resident killer whale

Researchers: Dane Pedersen (Principal Investigator), Master's of Science student, Department of Natural Resource Sciences at McGill University, Montreal, Quebec, Canada. Email: dane.pedersen@mail.mcgill.ca

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Objectives: New strategies are required to respond to the complexity of the management challenges facing the southern resident killer whale population in the Salish Sea. This project asks broad questions about how multiple stakeholders involved in southern resident killer whale management can more effectively work together to achieve sustainable outcomes. In particular, this research aims to understand the different dimensions of trust and perceived risk affecting inter-organizational collaboration within a transboundary setting. This will involve asking questions about:

1. your professional role;
2. other organizations you work with;
3. the channels you use to communicate with other organizations;
4. knowledge and the flow of information through a transboundary setting;
5. challenges of interorganizational collaboration
6. the formation and maintenance of trusting relationships with other organizations

Interview: You have been invited to participate in this research because of your professional role in an organization that deals with southern resident killer whales in the Salish Sea. We ask you to participate in an interview to share your experiences and ideas about how inter-agency trust and communication within the Salish Sea natural resource management system is functioning, and the potential for enhancing collaboration.

The length of the interview will be between approximately 1 hour. Due to COVID-19, all interviews will take place using Zoom. With your consent, interviews will be recorded and with handwritten notes. These tape recordings will be transcribed and ID coded to facilitate analysis. Once transcribed, the recordings will be destroyed.

Dissemination of the results: The expected audience for this research will include academic researchers and government agency professionals working in the field of fisheries management, research, policy, and governance. Research findings will be discussed with interested stakeholders at policy workshops organized virtually or at several locations in the Salish Sea

region. Findings will also be disseminated through scholarly publications and may also be presented at relevant academic conferences and professional seminars.

Confidentiality: The interviews will be kept confidential. Your name will not be associated with your interview unless you permit us to do so. This project is being done in collaboration with researchers at the University of Texas Rio Grande Valley and Wageningen University. All documents (interview notes, audio tapes, and interview transcripts) will be kept in a locked filing cabinet and/or stored on computer hard drives protected by password.
Risks: There are no foreseeable risks involved in participating in this project.

Contact information: If you have any questions or require further information with respect to this project, please contact Dane Pedersen at dane.pedersen@mail.mcgill.ca or at 250-571-4259. If you have questions about your rights as a participant in this research project, or if you would like to verify the ethical approval of this study, please contact: McGill Ethics Officer at 514-398-6831.

Consent: There is no compensation offered for your participation in this study. Your participation is entirely voluntary, and you can choose to decline to answer any question or withdraw at any point from the project. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, McGill University, or any other group associated with this project. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible. Data will be coded and analyzed within three months of the interview date. If you choose to withdraw during or right after the study, all information obtained up until that point will be destroyed unless you specify otherwise at the time of withdrawal. Following publication, data must be retained. We can then only remove your dataset from further analysis and from use in future publications. Once data have been combined for publication, it may not be possible to withdraw your data in its entirety. Identifiable data will be kept for 5 years. Once anonymized, withdrawal will no longer be possible.

I give permission for the audio recording of my interview _____Yes _____No

I have read the above information and I agree to participate in this study.

Signature: _____ Researcher's signature: _____

Name: _____ Date: _____

Thank you for taking the time to participate in this project.

Appendix 2 – Semi-Structured Interview Guide

1) What is you/your organization's mandate as it pertains to southern resident killer whales in the Salish Sea?

2) Tell me about the day-to-day work your organization conducts in relation to southern resident killer whales in the Salish Sea.

3) Where do you get your information about southern resident killer whales? (e.g. barriers to recovery, births and deaths, public reception)

4a) Are there any strategies that exist to facilitate communication between your organization and others? What are they?
4b) Who do these strategies include? (e.g. Canada and the United States; Indigenous and non-indigenous; DFO and NOAA)
4c) Do you think these strategies work? Why or why not?
4d) How could these strategies be improved?

5a) Which organizations do you communicate with most frequently?
5b) Why do you communicate with these organizations the most?
5c) Who do you contact in these organizations? Do you communicate with the same individuals every time?
5d) Why do you contact these specific individuals?

6a) Are there any organizations that you find it difficult to communicate with? Why?
6b) What strategies do you use to overcome these communication challenges? Have you found these strategies to be successful?

7a) In general, when you communicate with other organizations, what method(s) of communication do you use?
7b) What form of communication is the most beneficial to you? Why?

8a) Is communicating with other organizations important for your work? Why?
Alternative: Is communicating with other organizations a priority for you?
8b) If you were better able to communicate with other organizations, what kind of effect would this have on your work?
8c) What kind of support do you need to be able to communicate with other organizations better?

9) How has COVID-19 affected your communication with other organizations?

10a) What are the challenges that you encounter when working with other partner organizations?
10b) What strategies do you use to overcomes these challenges?

11a) Have you ever experienced any negative repercussions because of your partnerships with other organizations? (e.g. fines, sanctions, public shaming)
11b) If yes, what were these negative repercussions? How did it affect your work?

11c) If no, do you think that you could experience any of these negative repercussions because you were working with another organization?
11d) If no, have you ever been threatened with any of these negative repercussions?

12a) Have you ever failed to complete a task that required you to work with another organization?
12b) If yes, can you describe that situation to me? Who was involved? What was the task? Why were you unable to complete the task?

13a) How do you see you or your organization's influence in the decision-making processes (e.g. regulation, policy creation) regarding southern resident killer whales?
13b) If yes, how does that influence manifest itself? (e.g. hosting meetings, drafting reports, enforcing laws, allocating budgets)
13c) If no, why do you think that is the case?
13d) If no, in what ways would you like to acquire a greater say in the decision-making processes?

14a) Why do you trust or not trust the organizations that you work with?
14b) What are the things that make you trust an individual or organization more?
14c) What are the things that make you trust an individual or organization less?

Appendix 3 – Survey Questions

Demographic Questions

1) What is the main organization that you work for?
2) How long have you been working in this organization?
3) Please indicate which category best describes your current role? You may select multiple categories.
4) How long have you held your current position?
5) Although this study is concerned with people are involved directly and indirectly with fisheries, some participants may be more focused on particular fisheries than others. If you work directly with any of these fish species, please select them below. Select as many as apply.
6) Do you have a secondary affiliation with one of the following regional councils or commissions? Select as many as apply.

Dyadic Questions

1) Which of these regional and binational governmental organizations do you communicate with the most?
2) Which of these state/provincial governmental organizations do you communicate with the most?
3) Which of these United States federal governmental organizations do you communicate with the most?
4) Which of these Canadian federal governmental organizations do you communicate with the most?
5) Which of these Indigenous tribes do you communicate with the most?
6) Which of these non-governmental organizations do you communicate with the most?
7) Which of these business and trade groups do you communicate with the most?
8) Which of these research institutions do you communicate with the most?

Trust-Related Variables

1) Because we have been working with this organization for so long, all kinds of procedures have become self-evident.
2) In our relationship with the people in this organization, informal agreements have the same significance as formal contracts.
3) This organization can be relied upon to perform its objectives.
4) In our relationship with this organization, both sides treat each other in a consistent and predictable manner.

Risk-Related Variables

1) People in this organization may break promises.
2) The relationship with this organization will deteriorate in the foreseeable future.
3) People in this organization will take advantage of us when the opportunity arises.

4) The performance of this project is likely to decline in the foreseeable future.
5) Our objectives in the fishery management project with the organization will not be achieved.
6) This organization has no ability to offer us support when faced with difficulties in the management of this fishery.
7) In opposing this organization, we would be negatively affected in the future.
8) The actions of this organization may expose my organization to additional regulations if relevant rules are not followed.

Influence-Related Variables

1) Working with people from this organization has enhanced my knowledge of fishery science or management.
2) Working with people from this organization has led me to make professional choices or decisions that I would not have made otherwise.
3) Working with people from this organization has led to me to rethink my approach to the management of fisheries and/or harvesting and conservation policies.

Control Variables

1) In fishery management, there are a range of different ways in which collaboration is supported. Select from the ways that collaboration is supported with [SELECTED AGENCY TYPE] from the list below. You can specify the collaborative activity you partake in with this organization in the example column next to the corresponding category.
2) Are there other ways you collaborate with the selected organization that does not fall into the above categories?

Non-Dyadic Trust-Related Variables

1) You can't be too careful dealing with people.
2) People are almost always interested only in their own welfare.
3) Most people would try to take advantage of you if they got the chance.
4) In the fishery management of this region, the strongest side is expected not to pursue its interests at all costs.
5) When managing fish in this region, it is expected that any unfair dealings will be avoided or rectified by existing regulatory, legal, or reputational measures.
6) When managing fish in this region, people are expected not to make demands that can serious damage the interests of others.

Appendix 4 – Additional Statements from Key Informants

Theme	Perception	Sample Statements from Key Informants
Relational trust as a driver of communication	Positive	"I would say that a lot of [communication] ends up being in those personal relationships and over time. I have worked on this issue for about 8 years, so you start to have a sense for the work quality, who shows up, repeat players."
	Negative	"We share information in a variety of different ways: sometimes it is relational… I get a lot of information because I have been working in this sector for almost twenty years, people know me… they send me stuff directly because I have built good relationships with people in the community, and that is big and problematic. It means that I get information and I share it with my team. If I leave, what happens to the [information] pipeline?"
Whale watching	Positive	"We are whale watchers. We make money off of this and so it's very hard for some of these groups to understand that even though we are a business as opposed to a charity or non-profit that we still have the best interests of the animals."
	Negative	"I brought the science to the table over and over and over that showed how much noise is impacting the southern residents. The one thing we can do right now is turn down the volume. Turn down the [vessel traffic] around them."
Sources of SRKW information	Positive	"[We get our information from] everywhere… We don't hold all the information, we know that. It is a variety of sources…There is a whole network of people and organizations that help support and gather and feed information into the system to help us better understand and inform our approach.
	Negative	"So here we have a [government contracted scientist] who is saying noise is not an issue for the whales, yet is directly benefiting from the industry that [they are] protecting... I reached out to NOAA and I said, "do you have any concern that you've got some contractors who are taking money from [organization name redacted]?"
Working remotely due to COVID-19	Positive	"For me, it is mostly emails and setting meetings. The meetings have been all virtual, which has been great for people who are far away, like Transport Canada and our DFO colleagues. [They] have been able to participate in a lot of whale watching stuff and coordination because they could and they didn't have to fly down."
	Negative	"I definitely miss the in-person face-to-face. I think that really helps build those relationships and even having a side conversation that is not on the agenda that you have during a break or before or after a meeting are some of the things that I really miss. I think COVID has affected those opportunities."
Information flow	Positive	"I am trying to think of how I would try to improve my communication, because I feel like I am at the center of it. I have all the channels open to me that I think that I need to have. I don't know how it could be improved for me. At the moment, there is not really a gap."

	Negative	"If there's information you want to find, there are ways to find it. I do feel like there's a lot of purposefully concealed information, but there's definitely information that might take a little more digging to get… For example, [it can be difficult] if you want to know where the southern residents now."
Environmental justice		"What I struggled with is that the orcas are not thriving because of the lack of salmon and too much pollution. Turns out, that is what has been happening to tribal communities for decades now. Why did it take 70 odd animals to pull together this amount of effort to figure out what needs to be done and amplify this when literally thousands of people have been suffering [from the same things]?"
Boundary spanners		"There are individuals who see beyond the scope… They see the connections and they will try to work with you. Finding those people is always the best course of action, especially, if they can find a way to shoehorn it into their existing portfolio of work and say "no, this fits somehow" and are willing to advocate to their managers…"
Obtaining authority		"A reflection that I have is that it has been about authority… I can't just see that need and say "I see the need and I will invent this system". I could get in a lot of trouble, and my agency could get in a lot of trouble, and the legislature could get mad at my agency and pull funding... It is weird how that stuff works. Having the blessing from the authority both gives people the safety net that they are not going to get in trouble for doing it, and it gives them the voice that people will respect, meaning that people will have to listen to you and help implement this."
Single-issue organizations		"There are groups that are entirely focused on one issue, like taking down the Snake River dams. [To them] that is the only thing that is going to save the whales and it is the most important thing. It's hard to get that group to bridge and coordinate with the group that is totally focused on reducing vessel impacts. Bringing those groups together to work toward a common goal, even though they really do have the same ultimate goal is very challenging."
Transboundary challenges		"I think the transboundary part of the conversation is tough because while we do have common goals and common ground, [Canada and the U.S.] often have different policies, procedures, different laws, different cultures. I think that can be a pretty big challenge. We have a lot of actions that are very similar in our recovery plans. When it gets down to the finer details, we have different vessel regulations right now between the two countries and it is very confusing and makes it harder to communicate and get compliance and all that stuff. I understand the reasons for that, but I think we need to work toward, where we can align, to do that as much as possible, whether that is between the countries or different levels like federal, state, provincial, county, whatever it may be…That can definitely be a barrier and a challenge."