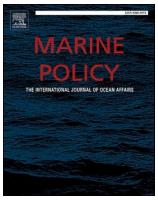
Marine Policy 171 (2025) 106469

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol



Assessing inter-organizational collaboration within the transboundary network governing the conservation of Southern Resident Killer Whales

Dane Pedersen [a,*], Owen Temby [b], Antonia Sohns [c,d], Evelyn Roozee [d], Gordon M. Hickey [d]

[a] The University of British Columbia, Faculty of Forestry, Department of Forest Resource Management, Vancouver, British Columbia, Canada
[b] The University of Texas Rio Grande Valley, School of Earth, Environmental, and Marine Sciences, Brownsville, TX, USA
[c] Northeastern University, The Roux Institute, Portland, ME, USA
[d] McGill University, Faculty of Agricultural and Environmental Sciences, Department of Natural Resource Sciences, Montreal, Quebec, Canada

ARTICLE INFO

Keywords:
Network management
Collective action
Coordination
Cooperation
North America
Ecosystem-based management
Orca

ABSTRACT

The Southern Resident Killer Whale (SRKW) is an endangered and charismatic species whose home range spans the Salish Sea, an ecosystem that extends across the Canada-US border. Conserving and recovering the SRKW represents a high-profile transboundary governance challenge that depends heavily on collaboration between a wide range of organizations. To better understand the factors affecting transboundary SRKW governance in the Salish Sea, this study applies a multi-dimensional trust, control, perceived risk framework to assess the inter-organizational architecture supporting collaboration. The analysis is based on key informant interviews (n=32) and surveys (n=35) conducted with policy actors working for different organizations involved with SRKW conservation and recovery in Canada and the US. Findings suggest that the SRKW governance network relies heavily on personal relationships and social control mechanisms while being fragmented by jurisdiction, social expectations, unclear communication channels, and competition for resources, requiring careful network management attention. Opportunities for integrating additional trust-building activities and social control mechanisms, combined with inclusive deliberative processes are identified.

1. Introduction

The Salish Sea is the inland body of water between Vancouver Island and the mainland of British Columbia province, Canada and Washington state, USA (see Fig. 1). Roughly 18,000 km^2 in size, 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. 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 (Tucker & Rose-Redwood, 2015). Today, under colonial rule and Western ideologies, the governance of this region looks very different. Policy decisions made on one side of the Canada-U.S. 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 governing the Salish Sea for decades (Fraser et al., 2006), and some initiatives have been tried (e.g., the Puget Sound Georgia Basin Task Force), there has been no international organization established to address transboundary ecosystem concerns [19].

The need for effective transboundary collaboration is perhaps most striking in the conservation and management of the endangered southern resident killer whales (SRKWs, *Orcinus orca*) residing in the Salish Sea. SRKWs are a highly charismatic species that hold significant cultural, ecological and economic value. For example, SRKWs are important contributors to Coast Salish lifeways [19,7]. The Lummi Nation considers SRKWs to be of familial relation and has given the whales the traditional name *Sk'aliCh'elh* [24]. The case of Luna or *Tsu-xiit*, a SRKW that garnered much media attention in the early 2000s and ultimately catalyzed a powerful demonstration of sovereignty by Mowachaht/-Muchalaht First Nation, further demonstrates the deep relational connections Coast Salish people have to SRKWs [35]. 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 [40]. SRKWs have become an

* Correspondence to: The University of British Columbia, Faculty of Forestry, Department of Forest Resource Management, Vancouver, British Columbia V6T 1Z4, Canada.
E-mail address: dp2641@mail.ubc.ca (D. Pedersen).

https://doi.org/10.1016/j.marpol.2024.106469
Received 8 March 2024; Received in revised form 26 September 2024; Accepted 19 October 2024
Available online 30 October 2024
0308-597X/© 2024 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC license (http://creativecommons.org/licenses/by-nc/4.0/).

Fig. 1. A map of the Salish Sea region. Image from the Nature Conservancy of Washington, washingtonnature.org.

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 [39]. SRKWs are a genetically and culturally distinct population of orcas, separate from northern resident, transient, and offshore killer whales which also inhabit the Salish Sea [45]. 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 [15]. SRKWs feed primarily on transboundary Chinook salmon [16,21]. As of December 2024, only 74 SRKW remain in the wild, making it a high policy priority[1] [41]. The main issues threatening the survival of this species include: a lack of prey availability, vessel traffic and noise, and habitat contamination [34].

1.1. Transboundary conservation and management of SRKW

Due to the home range of SRKWs spanning across the Canada-US border, their conservation and recovery poses a major transboundary governance challenge. SRKWs first received the designation of endangered in 2003 under the *Species at Risk Act* (SARA) [13], followed by the 2005 listing under the *Endangered Species Act* (ESA) [34], the federal legislation protecting at-risk species in Canada and the US, respectively. Despite their endangered status, the population of SRKWs continues to decline. While other transboundary resource management efforts between the two nations have had some success [18], the Salish Sea region is known to be fraught with collaborative management challenges due to the general lack of formal transboundary governance structures, or structures that attempt to create continuity between two or more separate policy environments (e.g., Canada and the US; [55]). In the case of transboundary SRKW conservation and management, Canadian and US federal government agencies have long struggled to address recovery challenges on their own, and collaborative success has also been limited. 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 [38]. These differences make it challenging to coordinate recovery efforts in a way that adheres to each country's unique policy landscape, while also respecting the ecological and cultural boundaries that define the Salish Sea. To do so, many different stakeholders and rightsholders are implicated in complex networks of communication to facilitate SRKW-related collaboration (see Table 1) ([12,23]; Roozee et al.).

The need for transboundary collaboration has already been documented in the federal recovery plans for the species in both Canada and the US [25,26]. For example, the "Action Plan for Northern and Southern Resident Killer Whales (*Orcinus orca*)" in Canada [13] 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 US [34] 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 successful conservation of the SRKW population, yet limited reported success with transboundary collaborative governance initiatives ([55]; Roozee et al.), the objective of this study is to, for the first time, document and analyze the inter-organizational relationships among the network of actors implicated in SRKW conservation governance.

[1] The Canadian federal [14] and Washington state governments [25] have committed more than US$1.3 billion to species recovery efforts.

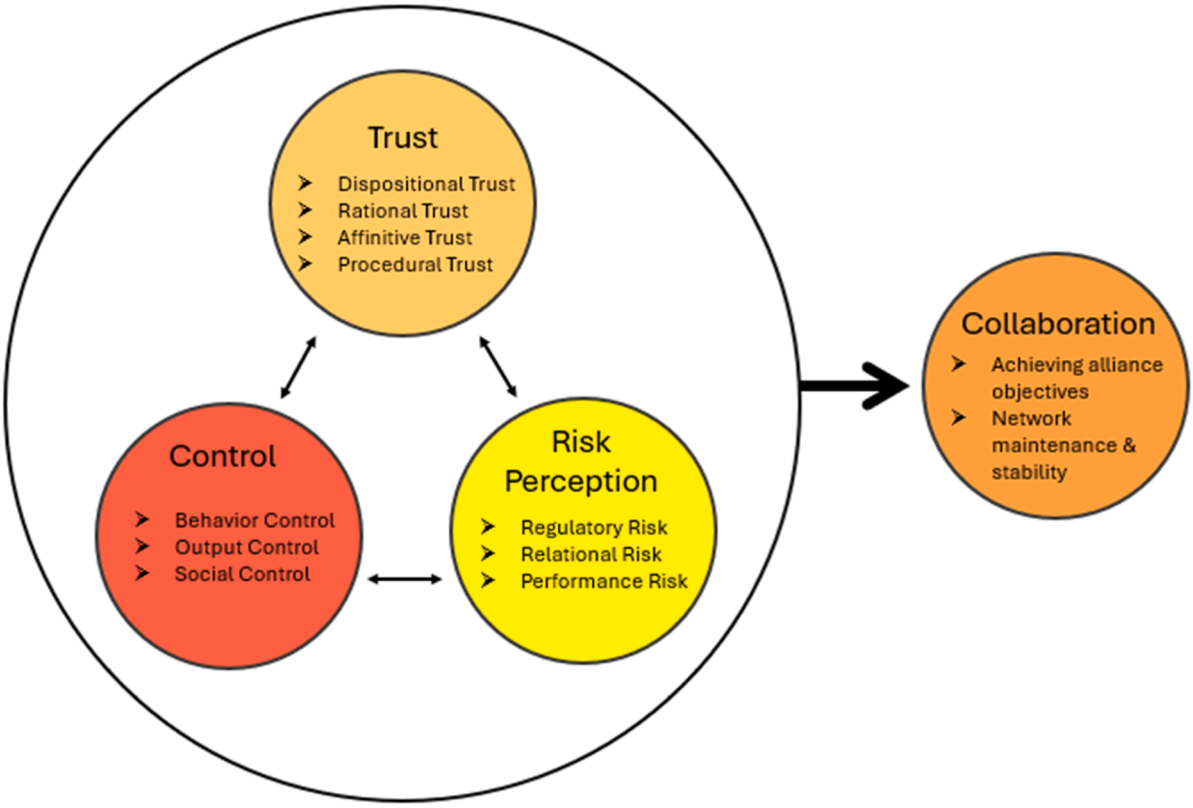
Table 1
Summary of Roles, Responsibilities and Key Features of Eleven Major Stakeholder Groups.

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 [35]]
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

2. Conceptual framework

Ansell and Gash [2] define governance networks as: "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). Previous research on collaboration in natural resource management (NRM) has identified several traits and activities that we expect policy actors participating in governance networks to exhibit. Among these are inter-organizational and community trust, risk perception among the actors, and the management control strategies that are employed to enable collaboration [23]. However, this literature is emerging and there exists a great deal of uncertainty on how these concepts work together, let alone context-specific knowledge of this in the Salish Sea on the challenge of SRKW recovery efforts.

According to Emerson et al. [12], collaborative governance encompasses: "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). Successful collaboration has two main requisites: shared recognition of interdependence, or that the desired outcome cannot be achieved by a single actor [12,4,46], and that the perceived risks of participating in an alliance are lower than the perceived risks of not participating [49]. To help understand the management challenges affecting the collaborative performance of interdependent organizations participating in collaborative NRM networks, [23,9,1,48] described and operationalized a multi-dimensional trust--control-perceived risk framework, offering a set of proposed relationships between each construct and the implications for collaborative performance (see Fig. 2). Within this multi-dimensional conceptual framework, perceived risk is considered the main barrier to collaboration, with various dimensions of trust and control interacting to mitigate different dimensions of perceived risk over time [23,22]. In what follows, we briefly describe each of the main concepts and their proposed inter-relationships.



Collaborative Framework		
Risk Perception	**Trust**	**Control**
Regulatory Risk: probability and consequence of a partner exposing the firm to sanctions from a third party by failing to comply with rules	**Dispositional Trust:** personality trait signaling one's predisposition to trust another entity	**Social Control:** focused on establishing a common culture and shared values
Relational Risk: probability and consequence of not having satisfactory cooperation	**Rational Trust:** calculative assessment of expected benefits and risks informed by the history of performance and predictability	**Output Control**: focused on monitoring performance
Performance Risk: probability and consequence that alliance objectives are not achieved, despite satisfactory cooperation	**Affinitive Trust:** hinges on emotions, charisma, shared identities or feelings of benevolence developed from longer-term interactions	**Behavior Control:** focused on process that turns appropriate behavior into desirable output
	Procedural Trust: fairness and integrity of the procedures involved	

Fig. 2. Inter-organizational collaboration framework for NRM networks. Sohns et al., adapted from [23]: Architecture of collaboration in inter-organizational NRM networks (based on the work of [9,1,48]).

2.1. Perceived risk

Perceived risk is a calculation of the expected dangers associated with entering a partnership, which can only be made with the available information. Perceived risk can be broken down into perceived relational, performance, and regulatory risk in inter-organizational NRM networks [23]. Das and Teng [9] 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 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 [1]. Identifying the kinds of perceived risk present in any given situation can allow network managers to act (drawing variably on different dimensions of trust and control) to reduce or better distribute perceived risks across an inter-organizational alliance.

2.2. Trust

Stern and Coleman [48] define trust as "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). They further 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 reflective of one's experiences and worldview. 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 network 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 interaction. *Rational trust* is built on the beliefs one holds about another's competence. Mayer et al. [32] 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. High levels of procedural trust promote predictability in the actions of others. It is distinct from affinitive and rational trust in that procedural trust places confidence in the system, rather than in any individual or alliance [6].

2.3. Control

Leifer and Mills [29] 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). *Behavioral controls* dictate 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; [11]). *Output control* mechanisms assess organizational or individual functioning, and therefore, require reliable measurements to set acceptable targets (e.g., a goal for the number of clicks to a webpage per day; [11]). *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., "ratting out" colleagues when they break the rules; [9]).

Among the issues in the management of the SRKW that this framework can inform are the stated need, by both federal governments, for a sustained and regionally based collaborative effort at SRKW conservation. The specific questions asked of this analysis are: (1) How is the inter-organizational and -community network connected? What is the general pattern that is revealed through an examination of what organizations are contacted by representatives of others? (2) What is the general distribution of trust types and risk perception types throughout this network? Are there specific inter-organizational relationships that exhibit certain types more than others? (3) How has perceived risk been managed by network participants with trust-building exercises and the use of control strategies? Have these efforts succeeded? Providing tentative answers to these questions can guide further investigations into the management needs for a robust collaborative network centered on the SRKW and, more generally, advance our understanding of the relationships among these concepts in NRM.

3. Methods

While previous studies in the Salish Sea have followed the transboundary journey of individual whales [28], the transboundary relationships between First Nations and non-Indigenous actors [35,36], transboundary SRKW recovery from governmental [42], industrial [44,8], and legal [26] perspectives, descriptive collaborative network analyses and associated transboundary network management strategies remain missing from the literature. As a result, we adopted an exploratory case study approach (Yin, 2018) that permitted the data to shape our analysis. Yin and Campbell [56] 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). Case studies use a variety of approaches to explore complex phenomena [20], including triangulation through multiple sources of qualitative and quantitative data.

3.1. Data collection

Qualitative data were collected through key informant semi-structured interviews conducted with members of the SRKW transboundary governance network between April and September 2021. A total of 32 interviews were completed, all of which occurred virtually due to the COVID-19 pandemic restrictions (Table 2). Respondents had diverse backgrounds within the SRKW governance network, spanning local (n=2), state (n=5), and federal governments (n=5), industry (whale watching, commercial and recreational fisheries, n=6), NGOs (n=13), and scientists (n=1) in Canada and the US. The only major group that was not engaged were Indigenous groups. Technological community capacity, a short interview time window, and COVID-19 safety protocols were reasons for this omission. However, we sought to include relevant information concerning Indigenous groups from interview data through questions exploring relationships with groups that the participant was not a member of.

In addition to interview data, quantitative survey data were collected between November 2021 and February 2022 targeting the different dimensions of trust and perceived risk presented in Fig. 1 (see [23];

Table 2
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
US 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*

Roozee et al.) using dyadic questions and Likert scale responses ranging from "strongly disagree" to "strongly agree" to gage respondents' agreement with the statements presented. The survey targeted a broader range of network actors working on fishery-related issues, with a total of 35 complete survey responses from respondents working on SRKW related-issues in a range of stakeholder groups (Table 2).

3.2. Data analysis

Key informant interviews were transcribed using the Express Scribe Transcription software. These data were then organized and coded following the recommendations of Miles and Huberman [33]. First round coding inductively explored common themes emerging from the data. Second round coding was guided by the first two stages of collaborative governance and their respective properties as identified by Tonelli et al. [51]. To investigate the interactions between various dimensions of trust, control, and perceived risk in our data, we pattern-matched (i.e., compared predicted theoretical outcomes with observed empirical outcomes) emerging findings with the anticipated relationships between the concepts presented in Fig. 2 and further described in Hickey et al. [23]. To create Figs. 3 and 4, we calculated the average of respondent's Likert scale survey scores toward target agency groups and color-coded findings according to the range of possible scores. To assess the general levels of trust and perceived risk reported in the survey data, basic summary statistics and data visualization methods were used.

3.3. 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, we engaged participants from different stakeholder groups to ensure multiple perspectives were considered in both our survey and interview data [52]. However, we recognize that responses were voluntary, and thus, biased toward agencies with the capacity to take on additional tasks. We also cross-referenced our qualitative and quantitative findings to confirm consistency across various dimensions of trust, control, and risk perception. Construct validity was addressed by using pre-tested questions adapted from those used by other scholars. Adopting a mixed-method study design allowed for data triangulation to help increase reliability. Another limitation is that no interview or survey data from Indigenous groups were collected. Despite the barriers to Indigenous participation, we acknowledge the legacy of Indigenous exclusion from institutions such as academia and their outputs. Our findings should therefore be understood as an incomplete representation of the SRKW network. 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 [10]. Two other important stakeholder groups that did not participate in this study were the Canadian and US navy, and key scientific organizations directly related to SRKW recovery. While multiple invitations were sent, no response indicating a desire to participate was received. These factors led to a sample that is not entirely representative of the SRKW governance network. We attempted to address this issue by collecting dyadic data (e.g., the linking of two dyad members through the response of a single member; [17]) and triangulating findings with interview responses Fig. 5.

4. Results

4.1. Network description

The SRKW governance network is diverse, spanning industry, multiple levels of government, NGOs, Indigenous communities, academics and researchers, amongst others. For the purposes of this paper, we 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.

Participants reported the presence of formal structures to promote conversation and collaboration regarding SRKW conservation on both sides of the Canada-US border with varying levels of perceived success. Some of these structures are highly contained and may only include

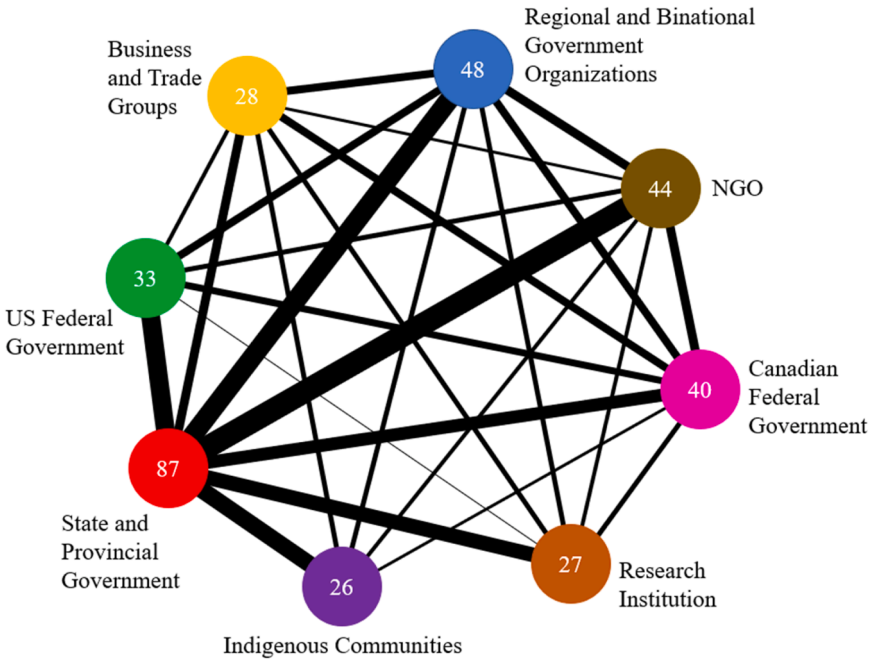


Fig. 3. A Map of Communications Between Eight Identified Agency Types. Line thickness indicates relative participant selection of the organizations within each agency type that they communicate with most frequently. The number inside each circle represents the number of ingoing and outgoing interactions as reported in survey data (N = 35, dyadic n = 333). Recorded responses indicating communications within their own agency group were not mapped.

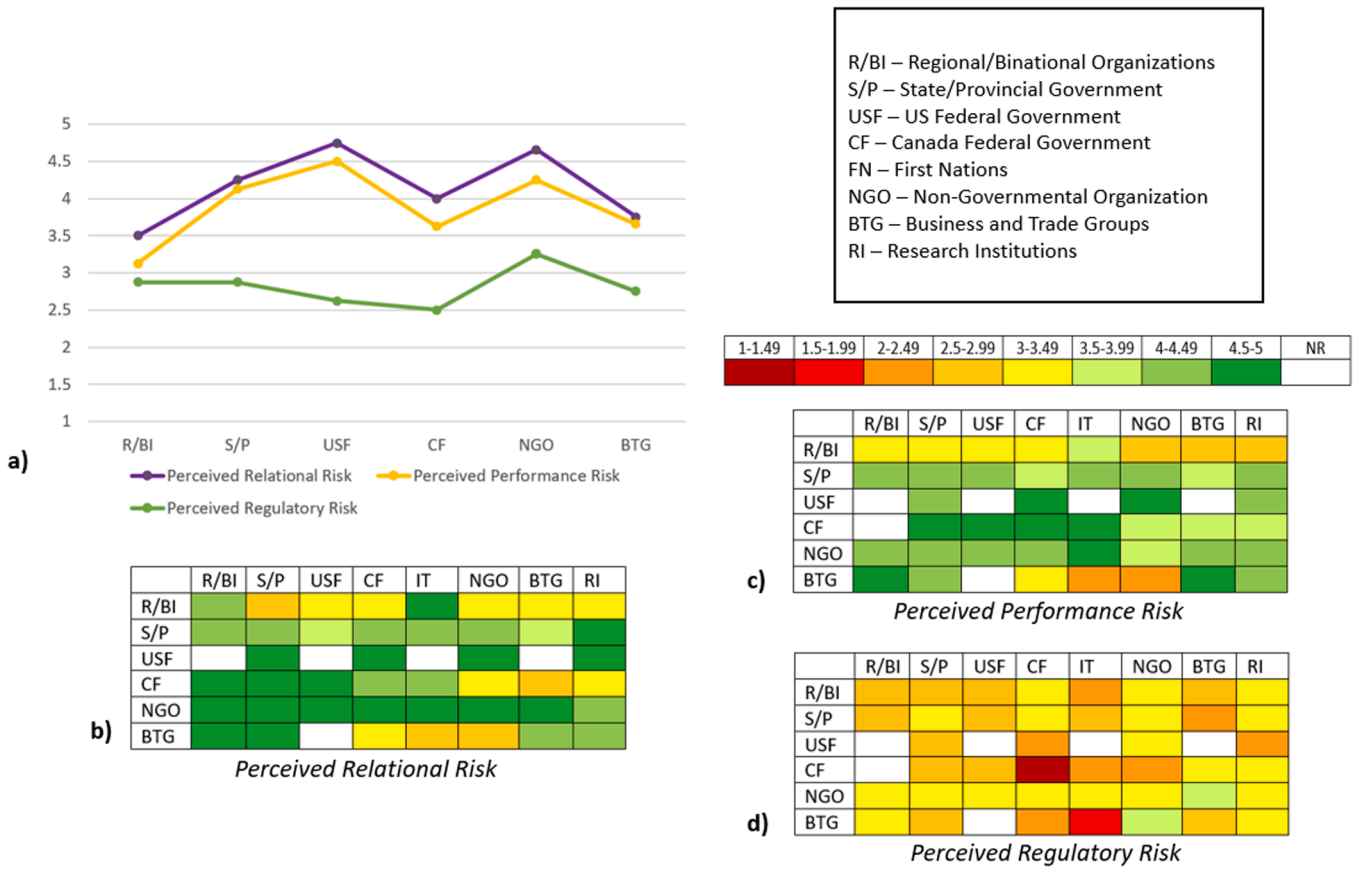


Fig. 4. The Average Ratings of Perceived Relational Risk, Perceived Performance Risk, and Perceived Regulatory Risk Dimensions. Each risk rating was directed toward target agency groups reported by respondents working in the SRKW transboundary governance network (n =33). (a) The average rating of each risk dimension by respondent organization groups. The average (b) perceived relational risk rating, (c) perceived performance risk rating, and (d) perceived regulatory risk rating toward target agency groups reported by survey respondents. 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. Each figure is reverse coded, with green coding indicates low perceived risk and red coding indicates high perceived risk, existing on a scale from 1 to 5. White coding (NR) indicates no dyadic data collected between agency types.

members from one stakeholder group, while others are more inclusive and incorporate participants from a wider variety of groups. However, there does not yet exist a forum that focuses on uniting transboundary Canada-US SRKW recovery efforts. The main obstacle mentioned by respondents was that it is challenging to have all relevant stakeholders included in the deliberation process. Some respondents described bypassing formal structures in favor of "back door" informal routes. These participants described the deliberative processes in place as being slow and time consuming, instead opting to engage those in positions of political power to expedite their desired results:

> "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…" (Canada Business and Trade Group employee)

In the SRKW governance space, some types of information were reported to flow more easily between organizations. Educational initiatives, for example, appear to be readily shared across agencies. In contrast, research data was described as often being withheld due to competition for resources and publishing credits. Respondents also described "one-way streets" – demands from a more influential organization or stakeholder to obtain information from less influential groups who receive nothing in return (see Tables 3 and 4).

Fig. 3 presents a partial communication network using the survey responses based on 206 dyadic data points across eight organization categories to provide a snapshot of the types of interactions occurring. With strong relative connections to all groups except for business and trade groups, the Washington state government was a central hub of communication for the survey respondents. We recognize the bias in our survey sample, as approximately half of survey respondents were employed by state or federal governments, but triangulation with interview data suggest this to be the case. This is likely because the Washington state government hosted the Governor's Orca Task Force, the first and only transboundary SRKW public forum in the Salish Sea, which further cemented the state's importance in collaborative communications.

4.2. Perceived risk

Fig. 4 summarizes the average perceived risk ratings by target agency types using the survey data. Respondents indicated low to moderate levels of perceived *relational risk* (Fig. 3) in their professional interactions with other organizations. Due to the endangered status of the SRKW, two key pieces of legislation 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 requirements, the organizations with whom the government works with are also implicated. 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. Our interview data suggest that these legal frameworks

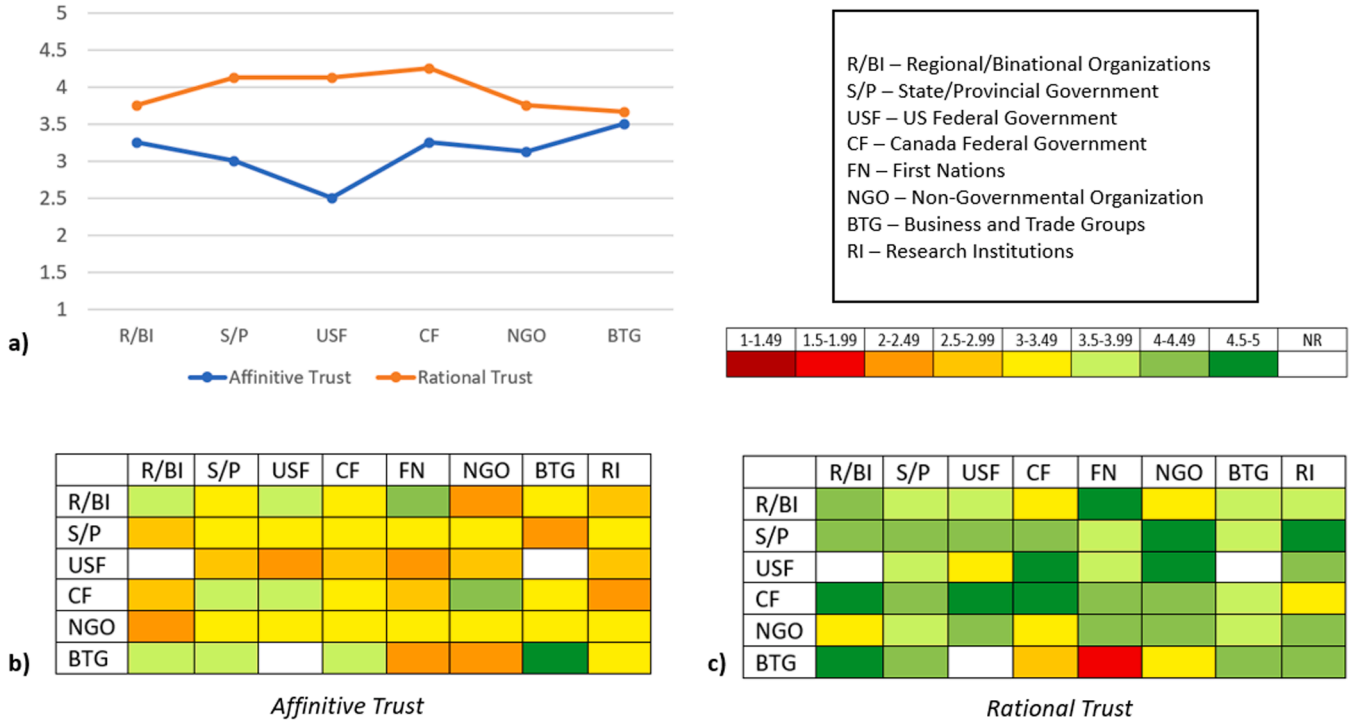


Fig. 5. The Average Rating of Affinitive and Rational Trust Dimensions. Each trust rating was directed toward target agency groups reported by survey respondents (n = 35) working in the SRKW transboundary governance network. The average rating of each trust dimension by respondent organization groups. The average (b) affinitive trust ratings and (c) average rational trust ratings toward target agency groups reported by survey respondents. 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.

provide a clear expectation that working with others is an inherent part of species conservation and reduces the perceived *relational risk* of doing so (Tables 3 and 4 provide further detail, with supporting quotes). The survey data also indicate low to moderate levels of perceived *performance risk*, a finding supported by the interview data. Similar to our explanation of overall rational trust levels, actors in the SRKW governance network have considerable experience and a generally high level of formal education that serve to reduce perceived *performance risk*. Further, 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 availability of these assets, in addition to a competent work force, contribute to low/moderate levels of perceived *performance risk* (Fig. 3).

The survey data shows that *regulatory risk* was the highest perceived risk of inter-organizational collaboration among respondents. 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 organizations (i.e., being "guilty by association").

4.3. Trust

The survey data sheds light on levels of *affinitive* and *rational trust* among a sample of actors in the SRKW governance network. Table 3 summarizes the reported network-level trust building activities, their identified relation to levels of perceived risk, and supporting quotes from our interview data.

Fig. 4a shows that levels of inter-organizational *affinitive trust* were generally lower than for *rational trust* among the different actor groups in the network. However, interview data suggests that high levels of *affinitive trust* generally exist in smaller sub-coalitions and alliances and in geographically isolated areas within the transboundary network, potentially contributing 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 likely does not promote *affinitive trust* at a network level, but rather reinforces the relationships, or lack thereof, already in place. Hickey et al. [23] suggest that by increasing network levels of *affinitive trust*, the perceived *relational risk* of inter-organizational collaboration can be reduced, pointing to an opportunity for greater transboundary interaction and exchange. A lack of *affinitive trust* between organizations was found to be especially prevalent between NGOs where no formal mandates requiring cooperation exist. This may be due to differing positions in the conflict over whale watching, which have stifled interaction within and between stakeholder groups, resulting in low overall levels of *affinitive trust*.

> "… 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." (US NGO Employee)

Based on our interviews, views on whale watching have such powerful implications that they appear to determine whether organizations will communicate or collaborate, even on SRKW issues that are not related to whale watching, making it difficult to establish mutual

Table 3
The Reduction of Perceived Risk through Trust Building Activities in the SRKW 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.

Trust Activity	Findings	Example 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 was found to moderately reduce perceived relational and regulatory risk among implicated SRKW network members.*	"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." "… there is bad blood between different stakeholders or different organizations… 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. • Activities outside of work were essential for creating affinitive trust with individuals inside and outside of their organizations. • *This activity was found to moderately reduce perceived relational risk among the implicated SRKW network members.*	"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."
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 collaboration between multiple organizations. • *Hickey et al. (2021) proposed that this activity would reduce perceived relational and performance risk among implicated network members, but it was described by research participants as being functionally absent across jurisdictions.*	"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 create 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. • *Hickey et al. (2021) proposed that this activity would reduce perceived relational and regulatory risk among implicated network members, but it was described as being absent by our research participants.*	"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."

interests. It can also result in personal attacks and strained relationships between organizations or individuals. Limited opportunities for network-level *affinitive trust* building activities were reported, placing a greater reliance on experience and existing interpersonal relationships when engaging in collaborative work:

> "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)

Fig. 4b shows that survey respondents reported moderate levels of *rational trust* in their interactions with other network actors. A moderate level of *rational trust* was expected, as many respondents had been working in the SRKW governance network for an extended period.

Table 4
The Reduction of Perceived Risk through Control Mechanisms in the SRKW 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.

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 was described as moderately reducing perceived relational and performance risk in the SRKW governance network.*	"[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. • *Hickey et al. (2021) proposed that this mechanism would reduce perceived performance and regulatory risk, but it was identified as missing in the case of transboundary SRKW governance by our respondents.*	"… 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 in the network, actors mentioned staffing and training new employees to be a laborious task. • 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. • *Hickey et al. (2021) proposed that this mechanism would reduce perceived relational and performance risk among transboundary network members, but it was described as generally inadequate in SRKW governance.*	"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 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 was described as reducing 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. • *Hickey et al. (2021) proposed that this mechanism would reduce perceived performance risk among network members, but it was described as inadequate in the transboundary SRKW network.*	"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 organizations, incorrect or absent representation of relevant groups, and forgoing formalized structures for "alternative routes". • *This mechanism was found to moderately reduce perceived relational and performance risk among the SRKW policy actors.*	"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." "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 was described as being adequate to reduce perceived relational and performance risk in the SRKW network.*	"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 was described as moderately reducing perceived relational risk among implicated SRKW network members.*	"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. • *This mechanism was being used in the SRKW network, and moderately reduces perceived relational risk among members.*	"[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."

Furthermore, most individuals working in species conservation in Canada and the US are likely to be university educated with sufficient knowledge and training to fulfill their professional responsibilities. Therefore, it seems reasonable for an organization to trust that other actors in the SRKW governance network have the relevant experience or skillset to complete their management duties, building *rational trust*, and reducing the perceived *performance risk* of collaborating [23]. However, conducting joint scientific research seems to be a challenge at a network level due to concerns relating to sharing data and credit prior to publication. Interview data suggests that network-level *rational* and *procedural trust* building activities do not function as well as those that build *affinitive trust* (see Table 3). This finding may be partially due to the SRKW governance network already exhibiting generally moderate levels of these trust types. Because the SRKW is a highly endangered population, *procedural trust* building activities were reported to be negatively impacted by the frequent changing rules of and guidelines that reflect population needs. The whale watching industry appeared to be the group that is the most impacted by such changes [e.g., the 2021 Washington state Commercial Whale Watching Licensing Program (Washington Department of Fish and Wildlife, 2021)], making effective *procedural trust* building activities more difficult and leading to higher levels of perceived *regulatory risk* [23].

4.4. Control mechanisms

Following our conceptual framework, control mechanisms can be used to reduce levels of perceived risk in the inter-organizational network, even in the absence of trust [23]. Table 4 summarizes the different network control mechanisms, their reported relation to levels of perceived risk, and supporting quotes from our dataset.

Of the three control types, *social control* was described as having the greatest effect on reducing relevant perceived risk types by increasing levels of *rational*, *affinitive*, and *procedural trust* (see [23]). Like *affinitive trust* building activities, most *social control* mechanisms (e.g. joint dispute resolution, networking opportunities) and some *output control* mechanisms (e.g. goal setting) in the SRKW network have been implemented through deliberative decision-making processes. *Social control* mechanisms were highly impacted by the COVID-19 pandemic, reinforcing network reliance on already established personal relationships and affinitive trust.

Output control mechanisms were described as moderately functional, 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 had 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-US equivalent for SRKW recovery. Other *output control* mechanisms, like funding structures, were described as 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 *relational risk* (see also [23]).

Behavioral control was described as the least successful control type in the SRKW governance network due to difficulties with enforcement that arise from a lack of cooperation. Divisions that separate government into branches and inconsistent departmental mandates were identified as a barrier to collaboration: "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 *behavioural control* being used in the network, although several respondents described staffing strategies as isolating network newcomers, thereby decreasing levels of *affinitive trust* and increasing levels of perceived *relational* and *performance risk* resulting in lower collaboration. This finding can be attributed to the reported sub-optimal *behavioral control* mechanisms functioning in support of transboundary Canada-US collaboration. A similar pattern between *behavioral control* and *rational* and *procedural trust* was also observed, leading to higher levels of perceived *performance* and *regulatory risk* in relationships.

5. Discussion

In conducting this analysis, we recognize there is presently (2024) no formalized transboundary Canada-USA SRKW governance network operating in the Salish Sea. There are however a wide range of implicated actors working together within and across jurisdictions to conserve the SRKW (Table 1). This paper is novel in its use of both a quantitative survey instrument and qualitative interviews to better understand the 'inner' social dynamics affecting transboundary SRKW governance in the Salish Sea. Through key informant interviews and survey data, we chronicle and evaluate the factors affecting collaborative performance of the transboundary network governing the SRKW. The results describe a governance network that is fragmented by jurisdiction, social expectations, confusing communication channels, and competition for resources, requiring careful management attention. Further bi-national policy attention to support transboundary SRKW management success in the Salish Sea region is warranted.

The generally limited use of trust-building activities, particularly those focusing on rational trust and procedural trust (Table 3), is contributing to the high levels of perceived risk reported by policy actors implicated in the transboundary SRKW network. This finding suggests there are some opportunities to improve the collaborative performance of the SRKW governance network, for example through enhancing the scale and reach of joint scientific research among stakeholders, and the joint creation of shared policies and procedures concerning collaborative SRKW conservation. The reported lack of behavioural and output control mechanisms required to structure transboundary Canada-US SRKW governance is also driving collaborative risk perceptions among implicated actors, limiting collaborative performance (Table 4). Examples include a lack of clear reporting structures concerning transboundary SRKW conservation and management, and fragmented planning and budgeting arrangements that create a competitive operational environment. While we found that collaborative inter-organizational relationships do exist throughout the Salish Sea region, these relationships cluster around sub-alliances and coalitions rather than spread across the entire network. As a result, our data indicate that transboundary information flow is not being effectively managed in the SRKW governance network. Open access data may be one potential option for increasing transparency and supporting information-sharing between organizations. Social control mechanisms, such as those that foster casual, off-the-record discussions are having positive effects on existing goal consensus [47], cultural blending [22] and coordination [50] activities, however there appears to be room for improvement (Table 4). Examples include joint dispute resolution mechanisms, attendance at transboundary meetings, events and conferences, and informal social networking opportunities such as field tours.

Given that the SRKW transboundary governance network has not yet achieved a formal collaborative state, despite efforts to this end since 1909 [55], it seems likely that there remains a deficiency in facilitative transboundary leadership [2], suggesting a need for 'boundary spanners'. According to Williams [54], 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 fragmented networks like the one governing the SRKW, these individuals can play a key role in developing trust and fostering collaborative efforts across organizational or jurisdictional boundaries by planning informal interactions, and advocating for transparent, inclusive and deliberative processes [5]. Coast Salish communities whose traditional territories cross the international border separating Canada and the US may be

uniquely positioned to operate as international boundary spanners. Many Coast Salish people refuse to acknowledge the Canada-US border and instead "perform unity" by understanding and representing themselves only as Coast Salish [35]. The performance of unity extends beyond identity to governance, where the health of air, water, and land are intimately connected to Coast Salish wellbeing and decision-making [35]. Uplifting Indigenous perspectives on relationality and governance, grounded in principles of reciprocity and respect for both human and non-human kin [27,53], may be critical for establishing Coast Salish communities as boundary spanners and in other roles of influence in the region.

A dedicated Network Administrative Organization (NAO) would also help to structure and coordinate collaborative efforts across organizational boundaries [3]. NAOs are designed to shape policies and allocate resources to reduce conflict, improve network competency, simplify management processes, and formalize coordination mechanisms – all of which allow for better network performance and reduced opportunistic behavior [30,31,43]. Since NAOs are 'arm's length' entities, they can help to smooth communication between different organizations that may have differing mandates, an issue repeatedly brought up in SRKW interviews. The creation of an SRKW-focused NAO in the Salish Sea region has the potential to facilitate informal interactions and advocate for fair, transparent and inclusive deliberation processes, engaging all stakeholder and rightsholder groups in meaningful participation in SRKW governance [5]. NAOs can help network participants engage with those they do not frequently interact with and build greater mutual understanding, trust, and set expectations of good outcomes (Offor Ogurno, 2016). This would be particularly important in the SRKW case where the divisive issue of whale watching has prevented groups from collaborating on other issues. Additionally, Offor Ogurno [37] found that over time, network participants engaged with one another directly and only minimally use the NAO to initiate collaboration indicating the ability of NAOs to foster lasting relationships based on more than formal mandated interactions.

It is important to acknowledge that the COVID-19 pandemic had a notable impact on our ability to engage with local communities and hold in-person meetings, which has affected our study results, particularly the omission of Indigenous perspectives concerning SRKW governance. Engaging with First Nations in Canada and Indigenous tribes in the United States concerning transboundary governance of the Salish Sea will offer important directions for future research. We acknowledge that working with Indigenous rightsholders to include perspectives that our analysis could not consider, and learning how network governance research can be shaped and framed to constitute actionable knowledge for non-Western epistemological traditions would improve it and extend its reach. Future research could also expand upon the idea of ecosystem-based management by documenting the interactions between the SRKW transboundary governance network and closely related resource governance networks, such as that of Chinook salmon, to place findings within a more holistic Salish Sea context. Further investigation into the viability of different transboundary collaborative control mechanisms in the region has the potential to inform transboundary SRKW conservation and management strategies.

6. Conclusion

In this paper we have shown that by assessing multiple dimensions of trust, control, and risk perception, and their multi-level interactions, we were able to evaluate inter-organizational collaboration challenges and opportunities of relevance to transboundary SRKW governance. The results suggest that the social norms regarding whale-watching and knowledge sharing are presently limiting network collaboration. Ineffective or non-existent behavioral and output control mechanisms are contributing to high levels of perceived inter-organizational collaborative risk across the network. There also appears to be an opportunity to integrate new social control mechanisms into already successful inclusive deliberative processes to enhance knowledge sharing and collective action. The central role that the Washington state government already plays in network-level communication will need to inform Canada-US network governance strategies going forward. As a transboundary species, the implementation of effective SRKW recovery policies requires greater collaboration across cultural, organizational and jurisdictional boundaries, likely requiring a formal coordinating institution to synchronize recovery efforts between Canada and the US [55], and between government and non-state actors, including Indigenous peoples.

CRediT authorship contribution statement

Gordon Hickey: Writing – review & editing, Writing – original draft, Supervision, Resources, Project administration, Methodology, Funding acquisition, Conceptualization. **Owen Temby:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Dane Pedersen:** Writing – review & editing, Writing – original draft, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Evelyn Roozee:** Writing – review & editing, Formal analysis. **Antonia Sohns:** Writing – review & editing, Methodology.

Acknowledgements

Social Sciences and Humanities Research Council of Canada (SSHRC) (grant number: 435-2020-0577) and the National Oceanic and Atmospheric Administration (NOAA) Office of Education, Educational Partnership Program with Minority-Serving Institutions (grant numbers: #NA16SEC4810009 and #NA21SEC4810004). The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of any agencies mentioned.

Data availability

The data that has been used is confidential.

References

[1] S.W. Anderson, M.H. Christ, H.C. Dekker, K.L. Sedatole, The use of management controls to mitigate risk in strategic alliances: field and survey evidence, J. Manag. Account. Res. 26 (2014) 1–32, https://doi.org/10.2308/jmar-50621.
[2] C. Ansell, A. Gash, Collaborative governance in theory and practice, J. Public Adm. Res. Theory 18 (2007) 543–571, https://doi.org/10.1093/jopart/mum032.
[3] T. Braun, Configurations for interorganizational project networks: the interplay of the PMO and network administrative organization, J. Proj. Manag. 49 (2018) 53–61, https://doi.org/10.1177/8756972818781710.
[4] T. Choi, P.J. Robertson, Deliberation and decision in collaborative governance: a simulation of approaches to mitigate power imbalance, JPART 24 (2014) 495–518.
[5] K. Coleman, M.J. Stern, Boundary spanners as trust ambassadors in collaborative natural resource management, J. Environ. Plan. Manag. 61 (2018) 291–308, https://doi.org/10.1080/09640568.2017.1303462.
[6] K. Coleman, M.J. Stern, Exploring the functions of different forms of trust in collaborative natural resource management, Soc. Nat. Resour. 31 (2018) 21–38, https://doi.org/10.1080/08941920.2017.1364452.
[7] J.M. Collins, The mythological basis for attitudes toward animals among Salish-speaking Indians, J. Am. Folk. 65 (1952) 353–359, https://doi.org/10.2307/536039.
[8] S. Cominelli, R. Devillers, H. Yurk, A. MacGillivray, L. McWhinnie, R. Canessa, Noise exposure from commercial shipping for the southern resident killer whale population, Mar. Pollut. Bull. 136 (2018) 177–200, https://doi.org/10.1016/j.marpolbul.2018.08.050.
[9] T.K. Das, B.-S. Teng, Trust, control, and risk in strategic alliances: an integrated framework, Organ. Stud. 22 (2001) 251–283, https://doi.org/10.1177/0170840601222004.
[10] M.L. Dion, C. Díaz Ríos, K. Leonard, C. Gabel, Research methodology and community participation: a decade of Indigenous social science research in Canada, Can. Rev. Sociol. 57 (2020) 122–146, https://doi.org/10.1111/cars.12270.
[11] Edwards, J., 2014. Mastering Strategic Managment - 1st Canadian Edition. BC Campus, British Columbia.

[12] K. Emerson, T. Nabatchi, S. Balogh, An integrative framework for collaborative governance, J. Public Adm. Res. Theory 22 (2012) 1–29, https://doi.org/10.1093/jopart/mur011.
[13] Fisheries and Oceans Canada, 2017. Action Plan for the Northern and Southern Resident Killer Whale (Orcinus orca) in Canada. ⟨https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/Ap-ResidentKillerWhale-v00-2017Mar-Eng.pdf⟩.
[14] Fisheries and Oceans Canada, 2018. Government of Canada taking further action to protect Southern Resident Killer Whales. ⟨https://www.canada.ca/en/fisheries-oceans/news/2018/10/government-of-canada-taking-further-action-to-protect-southern-resident-killer-whales.html⟩.
[15] Ford, J.K.B., Ellis, G.M., Balcomb, K.C., 2000. Killer whales: the natural history and genealogy of Orinus orca in British Columbia and Washington, 2nd ed. UBC Press, Vancouver, University of Washington Press, Washington.
[16] M.J. Ford, J. Hempelmann, M.B. Hanson, K.L. Ayres, R.W. Baird, C.K. Emmons, L. K. Park, Estimation of a killer whale (Orcinus orca) population's diet using sequencing analysis of DNA from feces, Plos One 56 (1) (2016) e0144956, https://doi.org/10.1371/journal.pone.0144956.
[17] Frey, B., 2018. The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation, SAGE Publications, California.
[18] M. Gaden, C. O. Brant, R. Lambe, Why a great lakes fishery commission? The seven-decade pursuit of a Canada-US fishery treaty. J. Gt. Lakes Res. 47 (2021) 11–23, https://doi.org/10.1016/j.jglr.2021.01.003.
[19] J.K. Gaydos, S. Thixton, J. Donatuto, Evaluating threats in multinational marine ecosystems: a Coast Salish First Nations and tribal perspective, PloS One 10 (2015) e0144861, https://doi.org/10.1371/journal.pone.0144861.
[20] J. Gerring, What is a case study and what is it good for? Am. J. Pol. Sci. 98 (2004) 341–354.
[21] M.B. Hanson, C.K. Emmons, M.J. Ford, M. Everett, K. Parsons, L.K. Park, L. Barre, Endangered predators and endangered prey: seasonal diet of Southern Resident killer whales, PLoS One 3 (2021) e0247031, https://doi.org/10.1371/journal.pone.024703.
[22] G.M. Hickey, H.T. Snyder, J.R. deVries, O. Temby, On inter-organizational trust, control and risk in transboundary fisheries governance, Mar. Policy 134 (2021) e104772, https://doi.org/10.1016/j.marpol.2021.104772.
[23] G.H. Hickey, R. Voogd, J.R. de Vries, A. Sohns, D. Kim, O. Temby, On the architecture of collaboration in inter-organizational natural resource management networks, J. Environ. Manag.. 328 (2023) e116994.
[24] Indian Country Today, 2019. Southern resident killer whales given Lummi name in traditional ceremony. ⟨https://indiancountrytoday.com/the-press-pool/southern-resident-killer-whales-given-lummi-name-in-traditional-ceremony/⟩ (accessed 16 January 2021).
[25] Inslee, J., 2018. Saving the Southern Resident Orca. ⟨https://www.governor.wa.gov/sites/default/files/documents/SRKW-policy-brief_Jan2019.pdf/⟩ (accessed 26 October 2021).
[26] C.S. Jefferies, D. Adie, Z. Bliss, S. Kent, Legal options (and obligations?) for enhanced Canada–United States cooperative southern resident killer whale conservation, J. Int. Wildl. Law Policy 24 (2021) 57–104, https://doi.org/10.1080/13880292.2021.1930334.
[27] Kimmerer, R. 2013. Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants. Milkweed editions.
[28] Knoth, J.M., 2019. Anthrozoology, Anthropomorphism, and Marine Conservation: A Case Study of Southern Resident Killer Whale, Tahlequah, and her Tour of Grief [Master's Thesis, University of Washington].
[29] R. Leifer, P.K. Mills, An information processing approach for deciding upon control strategies and reducing control loss in emerging organizations, J. Manag. 22 (1996) 113–137, https://doi.org/10.1016/S0149-2063(96)90014-8.
[30] Y. Liu, C. Tan, The effectiveness of network administrative organizations in governing interjurisdictional natural resources, Public Adm. 101 (2023) 932–952, https://doi.org/10.1111/padm.12834.
[31] L. Macciò, D. Cristofoli, How to support the endurance of long-term networks: the pivotal role of the network manager, Public Admin 95 (2017) 1060–1076.
[32] R.C. Mayer, J.H. Davis, F.D. Schoorman, An integrative model of organizational trust, Acad. Manag. Rev. 20 (1995) 709–734, https://doi.org/10.5465/amr.1995.9508080335.
[33] Miles, M.B., Huberman, A.M., 1994. Qualitative Data Analysis: An Expanded Sourcebook, 2nd ed. Sage Publications, California.
[34] National Marine Fisheries Service, 2008. Recovery Plan for Southern Resident Killer Whales. ⟨https://repository.library.noaa.gov/view/noaa/15975⟩.
[35] Norman, E.S., 2015. Governing Transboundary Waters: Canada, the United States and Indigenous Communities. Routledge, Oxfordshire.
[36] E.S. Norman, Finding common ground: negotiating downstream rights to harvest with upstream responsibilities to protect—dairies, berries, and shellfish in the Salish Sea, Glob. Environ. Polit. 19 (2019) 77–97, https://doi.org/10.1162/glep_a_00516.
[37] Offor Ogunro C.C. Network Administrative Organizations: Improving the Performance of Health Care Networks in a Developing Country Context. Doctoral dissertation, Harvard University, Graduate School of Arts & Sciences. 2016.
[38] A. Olive, The road to recovery: comparing Canada and US recovery strategies for shared endangered species, Can. Geogr. Le. Géogr. Can. 58 (3) (2014) 263–275.
[39] Olympics, 2021. Vancouver 2010 Olympic Mascots. ⟨https://olympics.com/en/olympic-games/vancouver-2010/mascot/⟩ (accessed 25 October 2020).
[40] R. Osborne, Trends in killer whale movements, vessel traffic, and whale watching in Haro Strait. Puget Sound Research'91 Proceedings, Puget Sound Water Qual. Auth., Olymp., Wash. (1991) 672–688.
[41] Parks Canada, 2024. Protecting the Southern Resident Killer Whales. ⟨https://parks.canada.ca/pn-np/bc/gulf/nature/ocean/erds-srkw/epaulard-killerwhale⟩ (accessed 29 August 2024).
[42] Rehberg-Besler, N., Jefferies, C.S., 2019. The case for a southern resident killer whale Emergency Protection Order under Canada's Species at Risk Act. J. Environ. Law 32, 137-161. Retreived from ⟨https://www.proquest.com/scholarly-journals/case-southern-resident-killer-whale-emergency/docview/2197128594/se-2?accountid=14656⟩.
[43] A. Saz-Carranza, S. Iborra, A. Albareda, The power dynamics of mandated network administrative organizations, Public Adm. Rev. 76 (2016) 449–462.
[44] E. Seely, R.W. Osborne, K. Koski, S. Larson, S. Li, Soundwatch: eighteen years of monitoring whale watch vessel activities in the Salish Sea, PloS One 12 (2017) e0189764, https://doi.org/10.1371/journal.pone.0189764.
[45] M.W. Shields, S. Hysong-Shimazu, J.C. Shields, J. Woodruff, Increased presence of mammal-eating killer whales in the Salish Sea with implications for predator-prey dynamics, PeerJ 6 (2018) e6062, https://doi.org/10.7717/peerj.6062.
[46] M. Song, Testing the forms and consequences of collaboration risk in emergency management networks, Soc. Sci. J. (2020) 1–16, https://doi.org/10.1080/03623319.2020.1744949.
[47] A.M. Song, O. Temby, D. Kim, A. Saavedra Cisneros, G.M. Hickey, Measuring, mapping and quantifying the effects of trust and informal communication on transboundary collaboration in the Great Lakes fisheries policy network, Glob. Environ., Change 54 (2019) 6–18, https://doi.org/10.1016/j.gloenvcha.2018.11.001.
[48] M.J. Stern, K.J. Coleman, The multidimensionality of trust: applications in collaborative natural resource ranagement, Soc. Nat. Resour. 28 (2015) 117–132, https://doi.org/10.1080/08941920.2014.945062.
[49] I. Supper, O. Catala, M. Lustman, C. Chemla, Y. Bourgueil, L. Letrilliart, Interprofessional collaboration in primary health care: a review of facilitators and barriers perceived by involved actors, J. Public Health 37, 716-727. (2015), https://doi.org/10.1093/pubmed/fdu102.
[50] O. Temby, J. Sandall, G.M. Hickey, R. Cooksey, Examining the role of trust and informal communication on mutual learning in government: the case of climate change policy in New York, Organ. Environ. 30 (2017) 71–97, https://doi.org/10.1177/1086026616633254.
[51] D.F. Tonelli, L. Sant'Anna, E. Barcelar Abbud, S. Aparecida de Souza, Antecedents, process, and equity outcomes: a study about collaborative governance, Cogent Bus. Manag. 5 (2018) e1469381, https://doi.org/10.1080/23311975.2018.1469381.
[52] Weiss, R.S., 1995. Learning from Strangers: The Art and Method of Qualitative Interview Studies. Simon and Schuster, New York.
[53] K. Whyte, Settler colonialism, ecology, and environmental injustice, Environ. Soc. 9 (2018) 125–144.
[54] P. Williams, The life and times of the boundary spanner, J. Integr. Care 19 (2011) 26–33, https://doi.org/10.1108/14769011111148140.
[55] Wondolleck, J.M., Yaffee, S.L., 2017. Marine Ecosystem-Based Management in Practice: Different Pathways, Common Lessons. Island Press, Washington, DC.
[56] Yin, R.K., Campbell, D.T., 2018. Case Study Research and Applications: Design and Methods sixth ed. SAGE Publications, Inc., California.