

CONTRIBUTED PAPER

Co-production in action: Navigating the research-to-implementation space in wildlife conservation through a Community of Practice

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Abstract

Effective conservation practices require addressing the divide between research and implementation. Co-production, which emphasizes collaboration and diverse knowledge exchange, is increasingly recognized as valuable in conservation to address this challenge, yet empirical insights remain limited. This case study explores using a Community of Practice (CoP) as an avenue for facilitating co-production in shorebird conservation. Centering researchers and practitioners within implementation initiatives, we evaluate factors enabling a successful CoP and barriers hindering members' experiences. Capacity emerged as the predominant barrier, while the leading factors contributing to CoP success were having a dedicated space to support labor division, relationship building, and informal learning among CoP members. Leveraging our evaluation insights, we offer practical recommendations for structuring a CoP to optimize these benefits and advance the integration of CoPs and co-production principles in conservation practice.

KEYWORDS

Community of Practice, co-production, research-implementation

1 | INTRODUCTION

In the face of global conservation challenges, it is crucial to promote the application of research findings to ensure effective, evidence-based conservation practices. However, a divide exists between conservation research and practice due to factors such as the inaccessibility of scientific information (Pullin & Knight, 2005), poor communication from science producers (Toomey et al., 2017), inadequate resources and funding for science and

application (Knight et al., 2008; Saunders et al., 2021), lack of organizational capacity (Comber & Dayer, 2019), and research findings not aligning with practical management applications (Matzek et al., 2014). This disconnect between research and practice is commonly referred to as the research-implementation gap (Knight et al., 2008; Matzek et al., 2014), or the research-implementation space (Toomey et al., 2017). Many frameworks and approaches have been proposed to help overcome the divide between research and action (e.g., Gillson et al., 2019;

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Kark et al., 2015; Saunders et al., 2021), with increasing emphasis placed on strategies that prioritize intentional collaborations between science producers (e.g., researchers and those who contribute to knowledge and information generation for scientific purposes; Safford et al., 2017) and science users (e.g., practitioners and those who use scientific information for decisions and policy-making; Safford et al., 2017). Developing intentional spaces to facilitate two-way communication and co-produce research and implementation strategies has the potential to make science more accessible, relevant, and actionable toward conservation outcomes.

Co-production, characterized by collaborative and iterative interactions between science producers and users throughout the research process (Beier et al., 2017; Cooke et al., 2021), has gained recognition as a means of improving conservation outcomes through diverse and multi-directional forms of knowledge exchange (Kelman et al., 2023; Roux et al., 2006). As a result, a wide array of best practices and recommendations are available on how to co-produce research, including building relationships across disciplines, sharing power between the partners involved, and investing in an ongoing dialogue between all partners (Beier et al., 2017; Chambers et al., 2021, 2022; Hickey, 2018). Despite the various practices and recommendations for facilitating co-production projects, there are limited empirical studies describing the approach and the results of co-production in practice, leaving the process and application of co-production unclear (Mach et al., 2020). Consequently, there is a need for evaluating processes and frameworks that promote co-production to gain a better understanding of its impact on conservation practices and outcomes. We present a case study illustrating the use of Communities of Practice (CoPs) to foster co-production among shorebird conservation professionals and facilitate the implementation of science best practices.

1.1 | Communities of Practice

A promising approach to facilitating co-production in conservation involves leveraging CoPs. A CoP is a group of people who work toward the same goal by sharing knowledge, resources, and expertise in a collaborative space (Wenger, 2011). CoPs are commonly used in healthcare (Ranmuthugala et al., 2011), business (Aljuwaiber, 2016), and education (Patton & Parker, 2017). There are three characteristics of a CoP that distinguish it from other teams and working groups, and these are referred to as community, domain, and practice. Community encompasses the members and interactions

between them; domain describes the shared interest among these members; and practice refers to how the community shares and develops resources and knowledge within the domain (Wenger, 2011).

By design, CoPs align with co-production best practices which emphasize building connections across organizations and disciplines through active engagement of all partners (Beier et al., 2017; Chambers et al., 2021; Saunders et al., 2021; Toomey et al., 2017). CoPs are structured to facilitate continuous communication and interactions among members by fostering collective responsibility, facilitating relationship building across different fields and organizations, and promoting active and regular participation from members to work toward shared goals (Wenger-Trayner et al., 2023). This emphasis on multimodal communication is vital for addressing the lack of interactions between science producers and users—a primary cause of the divide between research and implementation (Chambers et al., 2022; Matzek et al., 2014; Toomey et al., 2017). For these reasons, CoPs have been proposed as a means of engaging researchers and practitioners to improve environmental decision-making (Lawson et al., 2017), advance sustainability initiatives (Reed et al., 2014), and establish meaningful connections between people and nature (Beckwith et al., 2022). Despite the benefits CoPs might provide to the co-production process, evidence of using CoPs to promote co-production between science producers and users is limited.

CoPs have the capacity to enhance the implementation of conservation science and best practices by placing science producers and users together at the core of implementation initiatives (Figure 1). This is achieved by integrating peer-to-peer learning within the CoP structure, involving a continuous cycle of exchanging knowledge among participants, applying knowledge in practice, reflecting on the experience, and adapting strategies as implementation progresses (Gentry, 1990, pp. 9–20; Wenger-Trayner et al., 2023). Unlike conventional communication models, this approach demonstrates the potential of CoPs to mitigate implementation barriers and enhance collaboration through dynamic and inclusive interactions in research projects. By fostering transdisciplinary engagement, CoPs serve as a purposeful forum for new knowledge to be harnessed and shared within conservation fields (Watkins et al., 2018).

To understand the potential benefits of a CoP in conservation, we formed a transdisciplinary CoP (i.e., research that intends to solve multi-dimensional problems through multiple fields of knowledge and cross-disciplinary collaboration; Wickson et al., 2006), placing science producers and users at the center of shorebird disturbance reduction initiatives. We explore the dynamic of

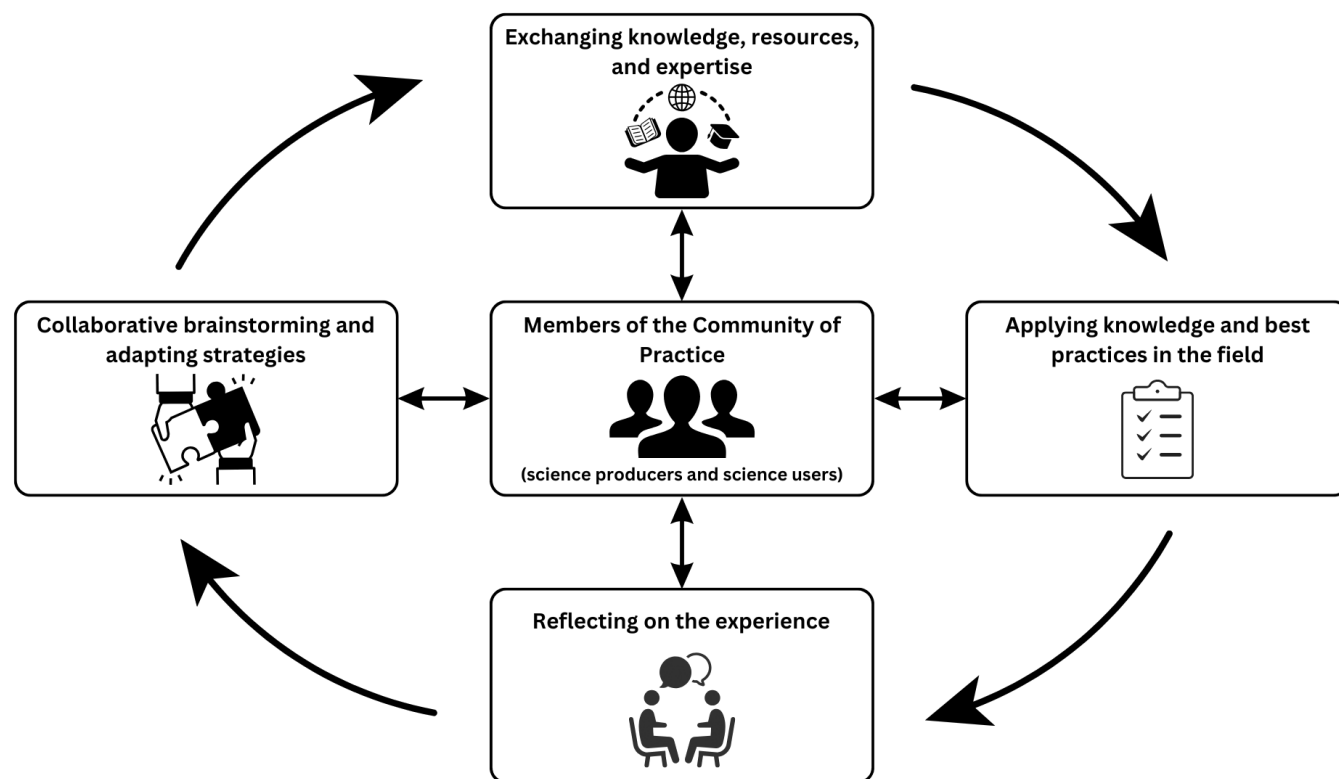


FIGURE 1 Community of Practice learning structure. Within the CoP structure, fostering peer-to-peer experiential learning practices cultivates a dynamic learning environment, placing science users and producers at the center of implementation initiatives. This iterative process ensures effective communication and collaboration at every experiential learning step, thereby facilitating co-production throughout the research process.

the CoP by understanding (1) what factors enabled a successful CoP from members' perspectives and (2) what barriers hindered members' experiences in the CoP. Based on our findings, we provide practical insights on structuring a CoP to promote the benefits and decrease the barriers commonly associated with science implementation.

2 | METHODS

To assess the outcomes of the CoP, we employed a case study methodology and internal evaluation using interviews of CoP members and a guided reflection discussion among the CoP facilitators. Case studies describe interventions and their outcomes (Yin, 2009, pp. 3–21) and have been used to demonstrate solutions to improve practices in conservation social science (Bennett et al., 2017). In an internal evaluation, an individual or individuals assess an organization or group they are involved in (Love, 1993). Internal evaluations are essential tools to enhance management practices, as the evaluators' direct involvement, familiarity, and credibility with the members have been shown to enhance the utility of results and findings (Dawson & D'Amico, 1985; Love, 1993; Yusa

et al., 2016). As such, the first two authors served as the internal evaluators of the CoP and consulted with the co-authors on the interpretations of the results and major findings.

As contributors to this paper, our group consists of researchers, practitioners, and communications specialists, most of whom are members of the CoP (S.L., A.A.D., A.Z., A.S., and N.S.). We recognize the interconnected roles and shared expertise among these positions, highlighting the collaborative nature of our work. Our success is grounded in shared experience, mutual respect, and a commitment to fostering a supportive learning environment. Our dual roles as contributors and active participants of the evaluation underscore our commitment to the outcomes in this evaluation (Karasov-Olson et al., 2020).

2.1 | Research context: Human disturbance Community of Practice

Human disturbance—when human activity alters the normal behaviors, activities, or physiology of a bird (Mengak & Dayer, 2020; Weston, 2019)—is a leading

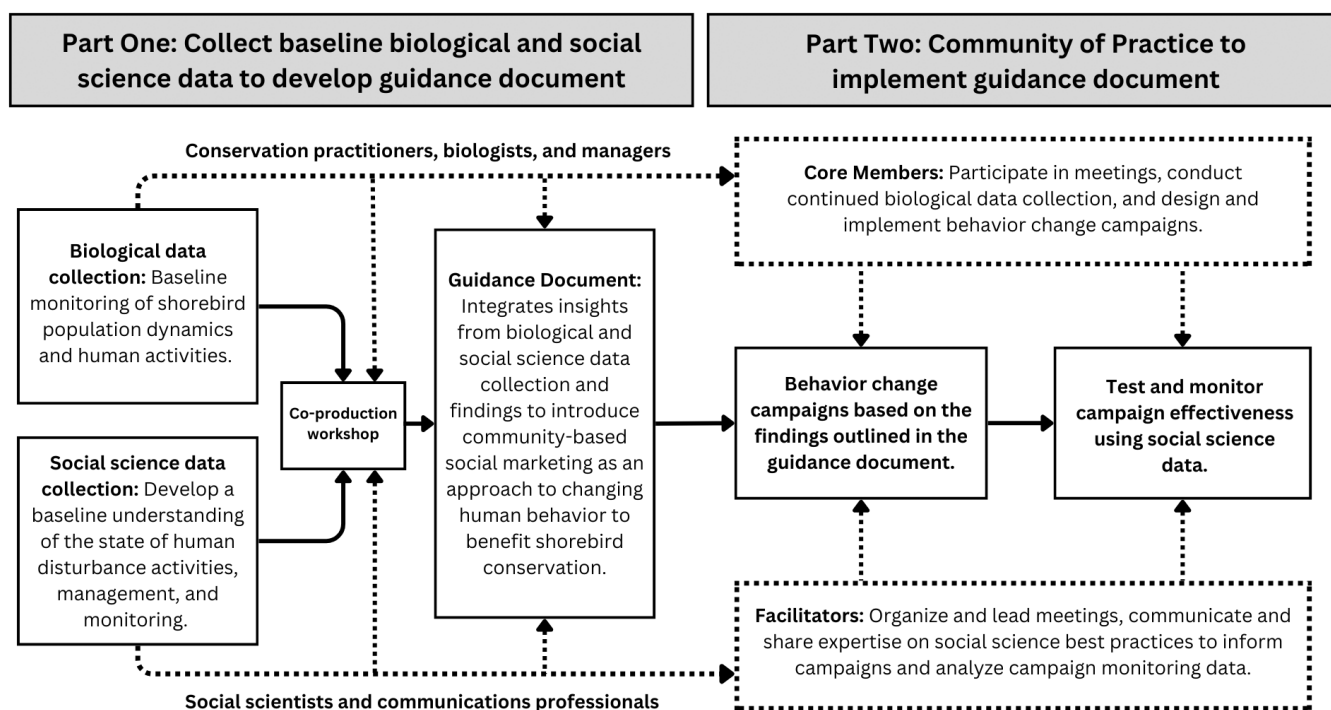


FIGURE 2 Schematic of co-produced social-ecological project and the components of the Community of Practice. Part one of the project involved independent collection of biological and social science data, which was synthesized into a guidance document following a co-production workshop among the science users and producers. Part two used a CoP to facilitate ongoing collaboration and support between science producers and users in designing, implementing, and monitoring campaigns based on the recommendations outlined in the guidance document.

threat to shorebirds (Comber & Dayer, 2019). To address disturbance challenges on the Atlantic Flyway (i.e., the flight pathway along the North American Atlantic coast that encompasses the entire range of migratory bird species; Boere & Stroud, 2006), the *Preventing Human Disturbance of Atlantic Flyway Shorebirds* project began in 2016. This project leverages biological science, social science, and the expertise of conservation practitioners and professionals to investigate the impacts of coastal recreational and management activities on shorebird population dynamics. In part one of this project, the science users and science producers independently collected biological and social science data about human disturbance of shorebirds, shorebird abundance and behavior, and the potential effectiveness of various types of human behavioral interventions (e.g., walking around flocks of shorebirds and leashing dogs on beaches). This data was then synthesized into a guidance document following a co-production online workshop (see Comber et al., 2021). The guidance document aims to assist conservation practitioners in developing targeted campaigns to change human behavior for the benefit of shorebird conservation, following the community-based social marketing framework by McKenzie-Mohr (2011). Due to staff turnover, new hiring, and changes in roles, only seven

members of our CoP were involved in part one. While the lead author was not involved, the other facilitators were.

Part two of the project focused on supporting science users in designing, implementing, and monitoring the behavior change campaigns based on the recommendations provided in the guidance document (Figure 2). To do so, we used a CoP involving both science users and producers. Campaigns were implemented by science users during the shorebird nesting and migratory seasons along the US Atlantic Coast, spanning from April to September. Throughout the implementation of these behavior change campaigns, project partners regularly convened in virtual CoP meetings.

The CoP consisted of 14 members from eight different states along the US portion of the Atlantic Flyway with various expertise and experience in shorebird-related work where CBSM behavior change campaigns were being implemented. According to Wenger-Trayner et al. (2023), members of a CoP can be classified as facilitators, core members, or peripheral members. The facilitators in the CoP are science producers (i.e., a graduate student, the project PI who is a social scientist and strategic communication expert, along with a communications professional) who focus on administration, organizing meetings

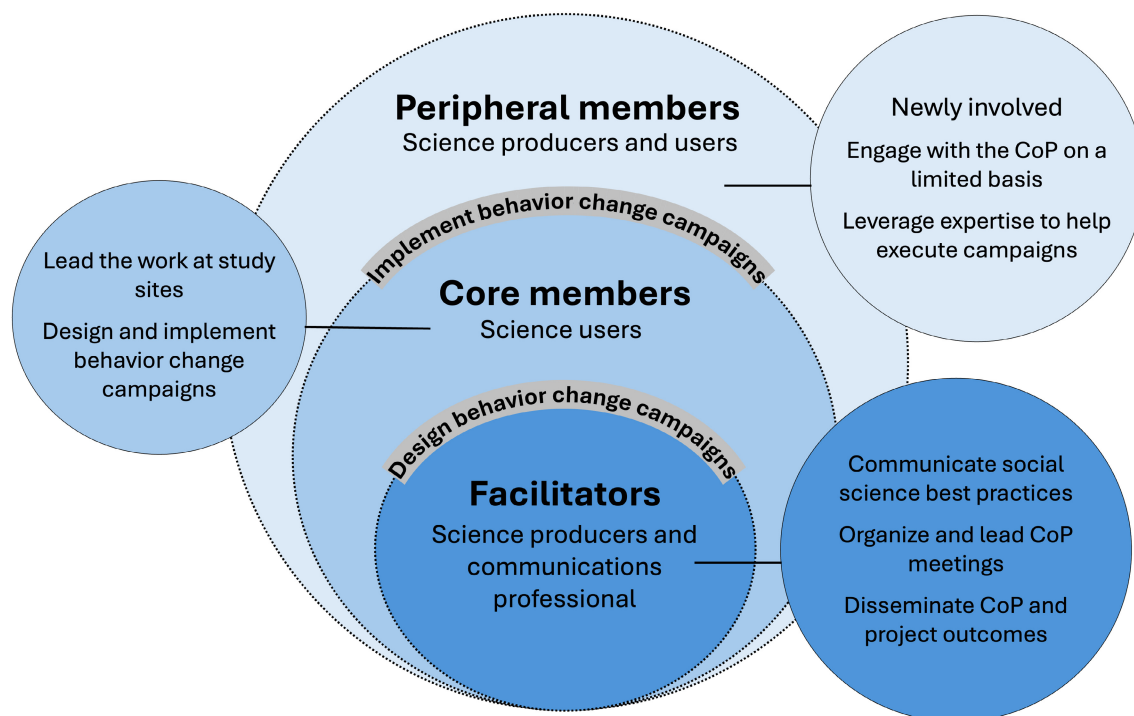


FIGURE 3 Levels of participation in the Community of Practice. Members of a CoP engage at varying levels, depicted by a concentric structure of participation. Facilitators lead the design and coordination of behavior change campaigns which drive CoP activities. Core members are essential in bridging planning and implementation by focusing on campaign execution. Peripheral members contribute support and expertise to campaign implementation but engage in a more limited capacity. The gray segments highlight areas where roles and responsibilities overlap, illustrating the collaborative nature of CoP participation.

to lead and guide CoP discussions, and disseminate CoP and project outcomes broadly ($n = 3$). Core members are science users (i.e., practitioners, biologists, managers, and coordinators) who regularly engage with the CoP, lead the work at study sites, and/or are directly involved in the design and execution of campaigns ($n = 8$). Finally, peripheral members are another group of science users who help support or implement campaigns but engage with the CoP on a limited basis due to reasons such as being new (i.e., seasonal interns; $n = 1$) or selectively participate on topics relevant to their expertise (i.e., funding or marketing; $n = 2$; Figure 3). We recognize that the terms “science producer” and “science user” are not mutually exclusive and acknowledge that the science users involved in this CoP generate expert knowledge in shorebird conservation. Many of the science users in the CoP have training as biologists, although most work for non-governmental organizations (NGOs) in applied roles now. We define these members as science users in the context of this paper because the CoP focuses on implementation of social science research. Additionally, the CoP had several transactional participants (i.e., those who engage with the CoP for specific, task-oriented purposes; Wenger-Trayner et al., 2023) who provided information and resources about the project and

campaigns—such as biological data collection protocols. However, we do not include transactional participants in the sample due to the limited engagement of these participants in regular CoP meetings (Wenger-Trayner et al., 2023).

Facilitators structured CoP meetings to support development and completion of campaigns and monitoring—such as campaign design steps (e.g., behavior selection, message design), protocol reviews, and the design of evaluation metrics—while also providing opportunities for members to gain support they felt they needed on campaign design and implementation. These meetings included time for sharing updates on campaigns, asking questions of their peer science users and science producers, receiving feedback, pitching ideas, and drawing inspiration from one another through informal discussions about campaign successes and challenges. Members of the CoP also worked together to develop and refine materials and products, such as graphics, signs, and websites to ensure that individual campaigns benefited from a collective effort and diverse expertise.

The CoP met virtually 20 times between November 2021 and April 2023 to design and brainstorm campaigns, discuss and reflect on implementation, and evaluate behavior change. Meetings were typically 90 minutes

long. Members in the CoP, including university researchers and those involved in the campaigns, received partial funding support from a foundation grant for their participation in the project. The grant provided full funding for a graduate student to lead the administrative tasks of the CoP.

2.2 | Interview design and implementation

We contacted all core members ($n = 8$) and peripheral members ($n = 3$) to request an interview via the CoP email listserv and requested a group reflection among the facilitators ($n = 3$) via email. Emails contained a link to a Google Form that included consent information, information about the interview and evaluation purpose, and a booking feature for members to schedule an interview on their preferred date and time. Once members consented to and scheduled the interview, a confirmation email was sent containing a personalized Zoom link (Zoom Video Communications Inc., 2022; Zoom Video Communications Inc., 2023). The lead author conducted interviews online with CoP members in November 2022 and led the facilitator group reflection in January 2023.

Interviews were semi-structured and generally followed the Centers for Disease Control and Prevention (CDC) Evaluation Interview Guide (CDC, 2015), which provided a rigorously tested and well-designed script template that aligned closely with our evaluation objectives. However, we modified the guide by adding questions about project-specific insights, CoP characteristics, and the function and value of CoPs following the value-creation framework (Wenger et al., 2011). See Appendix S1 for interview script. The facilitator group reflection was semi-structured, guided by predefined questions from the interview script; however, we removed any questions specifically related to implementation. The Virginia Tech Institutional Review Board (IRB #22-434) reviewed this protocol and deemed this work as an evaluation and “not research involving human subjects.”

We conducted interviews and the facilitator group reflection using Zoom with automatic transcriptions enabled. All discussions were recorded. At the beginning of the interview, the lead author informed members about the interview process and encouraged them to answer honestly based on their personal experiences in the CoP. Participants were also told that all positive and negative critiques were essential for enhancing the overall success of the CoP in the future. S.L. reviewed and manually reformatted recordings and transcripts to ensure accuracy, and qualitatively coded transcripts using

Dedoose (version 9.0.62; SocioCultural Research Consultants LLC, 2022). Transcripts were first coded using a thematic analysis approach to identify key themes related to the CoP evaluation objectives (Braun & Clarke, 2006). Subsequently, we created deductive codes following the best practices and recommendations for facilitating co-production and implementing science outlined in Beier et al. (2017) and Saunders et al. (2021). A co-author (A.A.D.; another social scientist) reviewed the code book and code definitions to ensure clarity (Table S1).

We removed all names and organizational titles from transcripts to protect confidentiality and participant identities. Interviewees received emails with quotes from their final transcript to ensure accuracy and clarity. We invited all facilitators and core members to be co-authors on a manuscript to highlight multiple perspectives of science co-production, following the suggestions of Saunders et al. (2021).

3 | RESULTS

3.1 | Respondents

Eight individuals consented to participate in interviews, all of whom were core members. The three members who were facilitators consented to participate in a group reflection. Some interviewees identified being new to working with shorebirds, having 1–2 years of experience ($n = 2$). The majority of interviewees ($n = 5$) indicated that they have been working with shorebirds for 5–10 years, with the exception of one member ($n = 1$) having 18 years of experience working with shorebirds.

3.2 | Division of labor

CoP members perceived that a leading benefit to participating in a CoP was dividing labor and sharing resources. Interviewees explained how collaborating and resource sharing can help address the capacity challenges they experience—such as time conflicts with field seasons, increased responsibility, and limited staff time—that often hinder their ability to apply research findings to their work. These challenges often result in overwhelming workloads, making the implementation of conservation research difficult. However, they noted that assistance from other CoP members could partially alleviate these barriers. As one member stated: “I don’t think if we had to do that individually it would have happened... So, having [another member’s] help with that was huge.” Because of the ability to divide labor among participants, interviewees found that allocating resources and

collaborating with other members was a successful factor of the CoP that enhanced their implementation capabilities:

...some of the strategies I was doing was based on or adapted from what the others were doing...I still feel a little bit washed this year, like I was trying to do things in the middle of the season when we're supposed to be implementing which is challenging...I definitely think...those graphics, especially, and the message...made it more clear and more impactful.

In addition to addressing members' immediate capacity challenges through resource sharing, interviewees discussed the broader impact of shared resources on shorebird conservation efforts. Members described seeing increased attention and desired use of implementation tools, like signs and graphics, by other sites and conservation organizations. Some members expressed feeling that these efforts would lead to more effective management, as there is a desire for standardized signage and communication across beaches along the Atlantic Flyway:

In an ideal world, we would have very similar signage and logos and wording across all beaches so if somebody is coming from Maine...down to South Carolina, they already have some recognition of the signage and what it means...this project has helped us get a little bit closer to that point.

Members also described how resources developed and shared within the CoP helped align with practical management applications. Reflecting on this practice and collaborative approach, one member noted the significance of cooperative efforts on implementation projects:

...this is a good standard for doing these kinds of projects. Looking at this division of labor...It really shows the benefit of these strong collaborations between different organizations...people with different resources...how easy it is actually to work together and create these kinds of products.

3.3 | Relationship building and communicating through regular check-ins

Members identified relationship building and informal communication as key factors enabling a successful CoP.

According to one member, collaborating in a CoP differs from how research is commonly done, where "someone devis[es] a protocol, or think[s] of a study, or writ[es] a grant, and then just giv[es] it to people, and they can go off and do whatever they want." This member described how stage one of the project operated this way, which established a disconnect between science users and producers. A facilitator also expressed having "very little interaction with the people involved" before involvement in the CoP. In contrast, members described how this CoP consisted of partners working together through the implementation process, improving how the work is done through regular check-ins:

People feel supported. They can share ideas. They don't reinvent the wheel. You notice discrepancies in how things are being done, so you improve your work, and you improve how people feel about doing the work.

Several interviewees elaborated on the supportive nature of the CoP, describing the positive and collaborative atmosphere during meetings. One member described CoP meetings as "really encouraging and uplifting," while others described interactions as "...very positive, very helpful in giving constructive feedback." Majority of members mentioned that they felt comfortable sharing ideas and updates on implementation, contributing to an ongoing dialogue of mutual support:

I could just reach out to anyone now with an issue or question or see if they've done work on this. Or likewise. If one of them reached out to me, I'd be like, "Oh, yeah. Here's this," and "what do you need?" I think just having that community now is super helpful.

Additionally, interviewees acknowledged the significance of these connections and having the community as an asset long-term. Members highlighted that the shared experiences with members of the CoP helped build and strengthen their networks, which will be a valuable resource for future collaborations:

The next time I see these folks that have been on the CoP calls at a conference, or in future meetings, or future projects...it's going to be helpful because we've already worked on a project together. It'll make things go smoother in the future...

Notably, individuals who identified being new to shorebird conservation underscored the importance of

camaraderie and community support they felt from their relationships with members of the CoP. They perceived these factors as having a substantial influence on their ability to implement their campaign and through net-working within the shorebird conservation space.

3.4 | Informal opportunities for knowledge exchange

Exchanging knowledge between science producers and users and within the group of science users was identified by members as another successful factor of the CoP. One member described how having access to social scientists to “help us think through the different steps and really applying them” was a major advantage to successfully implementing a campaign. Members also described that learning from science producers on how to use social science methods to implement effective behavior change campaigns helped strengthen their campaigns and programs:

I think being able to share the resources...the ideas behind them and how they were created was extremely important...learning kind of how to tailor messaging to invoke a specific action among audiences is something our volunteer stewards definitely benefit from...I can use some of that next year in our trainings with volunteers at all of our sites.

Outside of having access to science producers, some interviewees felt that participating in a CoP facilitated interorganizational and interdisciplinary collaboration between members, which was valuable for learning and designing campaigns:

...we were such a diverse group in terms of the organizations we work for and the different focuses of our organizations. I felt like it was more robust, and there was more divergent ideas and strategies than...if I was doing it with just my colleagues at [organization]...

Furthermore, interviewees felt that having access to other science users provided practical benefits. Interviewees described how learning from the shared experience of others improved communication between conservation professionals, understanding of the human disturbance challenges they face, and the diverse strategies used to address these challenges. One member described the potential outcomes of gaining access to this information:

I always look forward to seeing what's going on in other states and how we handle issues that might arise...After getting introduced and everybody putting themselves out there, being open, and actually listening to each other and their individual problems...I could be like, ‘...I'm starting to get this problem that I remember in the CoP. Let me go address it with someone who I know has been fighting through that for a long time.’

The willingness of CoP members to be open and actively listen to each other's challenges and successes contributed to the learning environment of the CoP. Members described feeling comfortable sharing updates, feedback, and challenges with the group and valuing the input and ideas from others. This was supported by a facilitator who shared “...everybody really did come not knowing everything. And that made it fun in a way. I think people kinda fed off learning from each other...what I observed was real collaboration, curiosity, respect, willingness to learn, and to teach.” The perceived impact of this learning structure and collaboration aided in creating actionable steps toward implementing campaigns, as described by one member:

And having the community of practice was a huge help...I can talk to other folks and see if they have any ideas. Run my ideas by people. Get some really valuable feedback. So, I thought it helps keep us on track and structured to be able to get to that point where we were actually implementing.

3.5 | Barriers that hindered members' experiences in the CoP

The main barrier to participation described by interviewees was capacity. Specifically, unpredictable and busy field seasons, combined with insufficient staffing, increased their responsibilities and led to an overall lack of available time. Some members highlighted the benefit of having multiple staff people involved from their site to alleviate some of these capacity burdens. For instance, one interviewee shared that even though they could not attend all the meetings, they still participated as much as they desired because another member from their organization would fill them in on what they missed and vice versa. However, this capacity was not available for everyone:

...it would be nice to have the capacity to be like there's two people. One of them is always going to be on one of these calls. But...we just don't have that. So, sometimes there was nobody from our state.

Many members described missing meetings during the field season due to low staffing for other functions in their organization which further stretched capacity to participate. To navigate some of these capacity barriers, members suggested that the CoP could provide support by developing materials that assist others in the future, thereby alleviating some of the pressures they face at the start of the field season. Interviewees found that adjusting the frequency of CoP meetings during the field season (monthly rather than every other week) was beneficial and reduced the pressure on their schedules. Additionally, members described that when facilitators provide clear objectives and timelines, it helps them prioritize tasks and stay on track with implementation.

4 | DISCUSSION

This evaluation aimed to assess how a collaborative CoP can be used in wildlife conservation by understanding factors that members perceived to enable a successful experience and identifying barriers that hinder member experiences and participation. The term “CoP” is often loosely applied without a thorough understanding of its distinctive characteristics (Iverson & McPhee, 2008). Recognizing the uniqueness of a CoP, as distinguished from teams, networks, and task forces, is crucial (Wenger-Trayner et al., 2023). CoPs emphasize collective learning to enhance the application of knowledge, practices, and resources and involve active practitioners who can benefit from the collective knowledge and resources of the CoP (Wenger-Trayner et al., 2023). In addition, members of a CoP work together toward a shared goal, which we found provided a useful asset for aligning objectives and fostering collaboration within the project.

Although the CoP did not address all barriers that inhibit science implementation, having adequate funding and science producers to serve as facilitators was essential for keeping on track and organized, as described by Watkins et al. (2018). These foundational structures enabled CoP success by serving as a dedicated platform for labor division, improving relationships and communication, and providing informal learning opportunities among members. This discussion explores the CoP's role in navigating the research-implementation space, offering practical recommendations to facilitate co-production processes and addresses gaps in the literature regarding

the application of co-production principles (Mach et al., 2020).

4.1 | Using a CoP to divide labor and facilitate resource sharing

Our findings highlight how dividing labor and sharing resources within the CoP addressed some of the capacity challenges that hinder science implementation. This is particularly relevant in shorebird conservation, where capacity challenges pose a significant barrier to actionable science (Comber & Dayer, 2019) and remains true for science users in this CoP who still struggled with these issues. Members expressed that these challenges limited their ability to attend CoP meetings at the level they desired. However, they also described CoP meetings as dynamic platforms for collaboration and resource sharing, which enhanced their implementation capabilities.

Interviewees shared that the co-produced materials—such as web pages, signs, and graphics—were instrumental in overcoming individual capacity restraints. By leveraging the collective effort of the community, members could allocate their time more efficiently, achieving more together than they could individually. This willingness to support other members of the CoP shows how the unique focus of the CoP on community sharing and collaborative development of resources and knowledge can play a critical role in dividing labor.

We found that the CoP served as a catalyst for overcoming capacity and resource constraints by harnessing collaborative efforts into its practice. To optimize practice into the CoP structure and reduce capacity challenges, we recommend that facilitators leverage email lists and establish dedicated time during meetings to solicit areas of support from members to gauge priority needs. Additionally, shared workspaces, such as Google Drive or Basecamp, can house all materials related to the shared goal of the CoP. These digital platforms provide members with a centralized space for sharing resources and accessible means for immediate feedback and collaboration.

Importantly, we found that CoP meetings play a critical role in resource sharing, actively encouraging members to share materials to foster an environment of constructive dialogue. This real-time exchange of resources ensures that members benefit from the collective expertise within the CoP. For example, interviewees noted that being able to access a repository of materials made by other CoP members allowed them to quickly implement evidence-based practices without having to develop these resources independently, making their campaign more impactful.

4.2 | Using a CoP to improve communication between project partners

Our evaluation insights highlight the crucial role of regular CoP meetings in providing a dedicated space for updates, addressing challenges, providing feedback, and enhancing perceived success of implementation strategies. Members emphasized that the shared experiences with members of the CoP helped build and strengthen their networks, which will be a valuable resource for future collaborations. This emphasis on diverse communication methods is essential in navigating the research-implementation space and addressing the often-limited interactions between science producers and users (Matzek et al., 2014; Toomey et al., 2017). Past research suggests that effective co-production requires fostering connections across organizations and disciplines, prioritizing active engagement, knowledge sharing, skill development, and participation from all partners (Beier et al., 2017; Saunders et al., 2021; Toomey et al., 2017). Our findings align with these principles, demonstrating that CoP meetings improved communication among project partners and cultivated a sense of community support among members, particularly those new to the field of shorebird conservation. The shift from traditional communication models highlights the CoP's potential in navigating communication barriers and underscores the need for more dynamic and inclusive communication structures in research projects.

CoPs aim to foster ongoing interactions among members (Wenger et al., 2011). In this collaborative environment, members build relationships, offer mutual support, and establish partnerships to achieve shared objectives. Notably, many science users discussed the personal benefits of having the opportunity to connect and build relationships with other science users. Our findings demonstrate that enhancing implementation outcomes extends beyond collaboration between science users and producers; collaboration among science users is equally pivotal. Recognizing the expertise of both science users and producers and incorporating multimodal communication in research projects is crucial for effective collaboration and application.

Aligning with the recommendations from Hauptfeld et al. (2022), we recommended that facilitators be intentional about forming a discussion-oriented space that supports relational components and active engagement from all members. Dedicating time during each meeting for members to share updates, successes, and challenges contributes to a more communicative and collaborative atmosphere. Structuring meetings in this way emphasizes adaptability and support, especially from science producers who play a significant role in addressing

challenges and feasibility of research protocols and objectives. Additionally, diversifying communication modes beyond meetings—such as email chains or shared documents—encourages continuous engagement from members. Platforms like Microsoft Teams and Basecamp can help organize project materials and facilitate ongoing discussions and quick exchange of ideas, feedback, and resources. Leveraging the CoP to embrace these recommendations can improve communication and enable research to align more effectively with practical applications, thereby alleviating some of the hindrances to the implementation of science best practices.

4.3 | Using a CoP to enhance knowledge exchange

While resource sharing and relationship building are essential factors leading to a successful CoP, we found that opportunities for knowledge transfer, skill development, and hands-on learning are equally important to the success of a CoP. This supports others' findings that relational components are fundamental in building capacity (Hauptfeld et al., 2022). The practical value of CoPs lies in members' ability to transfer knowledge gained within the group to their organizations and apply it to real-world scenarios (Wenger et al., 2011). Access to this knowledge helps improve programs and implementation. One interviewee noted that understanding the science and evidence behind the resources would benefit not only their current campaign but also future programs.

While members highlighted the advantages of having access to researchers, our findings suggest that opportunities for peer-to-peer learning among science users are equally informative for implementation. Members recognized the valuable expertise of each member, aligning with the CoP principles of treating all members as experts and individual learners (Wenger-Trayner et al., 2023). Our findings align with the growing recognition that traditional science research dissemination methods, such as peer-reviewed papers, may not be sufficient to ensure the adoption of scientific information (Fisher et al., 2020; Gossa et al., 2015; Hauptfeld et al., 2022; van Kerkhoff & Lebel, 2006). Instead, collaborative spaces should be established (Toomey et al., 2017).

CoPs thrive when those in conventional leadership positions engage as individual learners and welcome other voices (Wenger-Trayner et al., 2023). To fully optimize the learning potential within a CoP, we recommended following the insight we gained that peer-led discussions help CoP members gain new perspectives and practical solutions for similar challenges. CoPs can

embrace inclusive meeting practices that create an empowering environment where every participant feels encouraged to contribute. This can be achieved by alternating who leads meeting discussions and eliciting insights from members' personal expertise—allowing members to learn from lived experiences and scientific literature.

Facilitators can enhance inclusivity by soliciting a list of common challenges or topics from members, prioritizing time during each meeting for an open forum focused on these topics. Involving transactional CoP participants to share knowledge in these specific areas can also be beneficial. Additionally, we recommend that science producers actively seek feedback on metrics, protocols, and other project aspects. As our findings highlight, encouraging participants to reflect on their experiences in applying these approaches allows science producers to adapt and refine materials, ensuring research aligns with practical management applications. This iterative co-production of data collection materials enhances the practicality of implementation and contributes to the collective learning within the CoP.

5 | CONCLUSION

The findings from this evaluation suggest that this CoP helped to overcome common barriers to science implementation, such as inaccessibility of scientific information, poor communication, and inadequate resources. Consistent with the findings of Watkins et al. (2018), our case study demonstrates how a purposefully designed and adequately funded CoP can facilitate transdisciplinary collaboration and accelerate the progress of wildlife conservation. By providing a platform for regular communication, resource sharing, and problem-solving, this CoP enhanced the capacity of practitioners to implement scientific knowledge in practical conservation efforts.

AUTHOR CONTRIBUTIONS

S.L. and A.A.D. conceived the idea for the paper. S.L. wrote the paper with editorial contributions from all authors.

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CONFLICT OF INTEREST STATEMENT

By adopting an internal evaluation framework and co-production best practices, five authors (Sami Livingston, Ashley Dayer, Allyssa Zebrowski, Abby Sterling, and Nolan Schillerstrom) were members of the CoP under evaluation. Additionally, Ashley Dayer was a paid consultant of Audubon from July 2022 to June 2023 while on research leave from Virginia Tech.

DATA AVAILABILITY STATEMENT

The interview transcripts for this evaluation will remain confidential, as they contain social science data that cannot be fully de-identified.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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