



Executive Summary

Gender and Leadership in Wildland Fire Project

**An Outcome Evaluation of a Royal Roads
University Graduate Student Research Project**

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Cover photo: BCWS Wildland Firefighter. British Columbia. Photo: R. Reimer

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Executive Summary

Introduction

This report presents an outcome evaluation of a research project undertaken by a Royal Roads University (RRU) Master of Arts in Leadership (MAL) student. The Gender and Leadership in Wildland Fire Project (GLWFP) intended to raise discussion on gender and leadership in the wildland fire community by: identifying the gap between academic knowledge of issues pertaining to gender and leadership within the profession and organizational awareness of the gendered experience of wildland firefighters; creating a forum for discussion on the topic and building capacity (e.g., conflict resolution strategies); uncovering organizational and government awareness of the issue through a series of interviews with wildland firefighters and government actors, and a survey with the British Columbia Wildfire Service (BCWS) community; and presenting recommendations to address issues of gender discrimination at the BCWS. Wildland fire culture is described as a masculine space with clearly defined gender roles (Reimer, 2017a, p.12). Previous research reveals that gender discrimination is a prominent factor in the everyday experiences of wildland firefighters and fosters the cultural norm; however, in the BCWS, self-awareness of and reflection on gender is low. Recently, the wildland fire community has taken steps to broaden its diversity to challenge the status quo of this traditionally “highly masculinized occupation” (Pacholok, 2013, p.3). Gender discrimination and the broader concern of a hyper-masculine culture creates challenges at both the individual and organizational level that could lead to potential harm faced by male and female wildland firefighters alike, and has implications for diversity in leadership, decision-making, and risk management (Reimer, 2017a). The GLWFP intended to contribute to a more inclusive and diverse culture within the wildland fire profession by guiding organizational practice through discourse, advancing the professional skills and capabilities of the principal investigator (PI), and contributing to the academic discussion on the topic. This outcome evaluation assesses whether and how the GLWFP contributed to these outcomes.

Methodology

The evaluation investigates whether and how the GLWFP generated new knowledge, attitudes, skills, and relationships among key actors to increase the discussion on gender and leadership in the wildland fire community. The objective of the evaluation is to critically assess the GLWFP by collecting and analyzing information about its activities, outputs, and outcomes to support learning for research effectiveness.

The Outcome Evaluation approach used in this evaluation is designed to be applied to research projects and specifically transdisciplinary research, sustainability research, research-for-development, and other change-oriented approaches (Belcher et al., 2020). The approach assesses whether and how a research project contributed to the realization of outcomes through the use of a theory of change (ToC). A ToC can be used to provide a detailed description and model of why a change is expected to occur within a specific problem context using the underlying mechanisms of behaviour change conceptualized as changes in knowledge, attitudes, skills, and/or relationships (KASR). It models the causal relationships between a project’s activities and results, and how these are expected to manifest in outcomes, giving particular attention to the impact pathways, actors, and steps involved in the change process.

The evaluation team led a participatory workshop in November 2018 to define the scope of the evaluation, document the implicit ToC for the GLWFP (Figure 1), and identify possible sources of evidence to empirically test the ToC. The Outcome Evaluation method collects participant and stakeholder perspectives to identify and assess the contribution of factors within a change process (Belcher et al., 2020). To gather these perspectives, we conducted 26 interviews with 27 informants and reviewed 28 documents such as personal communications, journal articles, blog posts, and magazine articles. These sources of evidence were used to evaluate actual outcomes against the ToC, and answer the following questions:

1. Research Outcome Evaluation:

- a. *To what extent and how were outcomes realized?*
- b. *Were there any positive or negative unexpected outcomes from this project?*
- c. *Could the outcomes have been realized in the absence of the project?*

- d. *Were the assumptions pertaining to why these changes were expected sustained?*
- e. *Are the higher-level changes likely to be realized?*

Project design and implementation were characterized using a modified version of Belcher et al.'s (2016) Transdisciplinary Research Quality Assessment Framework (QAF). The QAF was used to highlight elements of research design and implementation that contributed to the achievement of outcomes. This assessed the degree to which the GLWFP incorporated recognized quality criteria of transdisciplinary research¹, organized under the principles of Relevance, Credibility, Legitimacy, and Positioning for Use. The project assessment was guided by the following questions:

2. Research Project Assessment:

- a. *What elements of the research design and implementation supported outcome realization, and how?*
- b. *To what extent and how did the project engage effectively with relevant stakeholders?*
- c. *To what extent were the research findings sufficiently relevant to achieve the stated objectives?*
- d. *To what extent and how are target audiences aware of and using the project outputs?*
- e. *How does RRU support student success in research?*
- f. *What lessons about effective research practice can be learned from this case study?*

Results were analyzed and grounded in the context of social change theories to address shortcomings acknowledged within literature (Weiss, 1997; Stachowiak, 2013) that the theoretical basis for many ToC's are weak. Researchers seldom make explicit the theories underlying why change is expected from their research. Social change theories used within the GLWFP include dialectical theory of organizational change, social capital theory, and empowerment theory to explain the implications of outcome realization.

Project Overview

By gaining insights into organizational, academic, and government knowledge on the topic of gender and leadership in wildland fire through scoping exercises, literature review, and primary data collection, the GLWFP aimed to facilitate a conversation about the experience of gender and leadership within the BCWS by creating a forum for discussion and subsequently presenting recommendations to guide organizational change. The GLWFP used a feminist appreciative approach to action research (AR) and followed the Action Research Engagement (ARE) model to focus on creating organizational readiness for change through open conversation (Reimer, 2017a). The GLWFP utilized the ThoughtExchange™ tool to collect qualitative data on participants thoughts perceptions, and feelings, and subsequent quantitative ranking by participants to indicate their agreement or disagreement of that thought (Reimer, 2017a). Additional qualitative data was collected through five semi-structured interviews representing diverse standpoints that emerged in the survey data to gain a deeper understanding of major themes. The key outputs of the GLWFP included: the identified gap between academic knowledge of issues pertaining to gender and leadership within the profession and low organizational awareness of such issues; new findings for academic audiences, such as men are also negatively affected by gender issues within the wildland fire culture; a forum for discussion and capacity-building (e.g., conflict resolution strategies); organizational knowledge and awareness on the topic (e.g., gender discrimination is occurring at BCWS and self-awareness is low, diversity in workforce is desirable, etc.); and evidence-based recommendations to acknowledge and resolve issues surrounding gender at the BCWS, cultivate capacity for organizational learning, and build partnerships to address issues pertaining to gender and leadership through organizational learning. The GLWFP aimed to contribute to key intended outcomes such as: uncovering participants' self-awareness about BCWS culture; fostering discussions on gender and leadership at multiple levels within BCWS; uptake and integration of recommendations by the BCWS; supporting the PI to continue work in gender and leadership in high-risk occupations; and increasing the conversation on gender and leadership within the academic community. Further detail regarding the GLWFP ToC is included below.

¹ The QAF is not meant to be a measure of excellence, but rather characterizes the project design and implementation in terms of the degree of its transdisciplinarity.

Project Theory of Change

The research aimed to contribute to positive change through dialogue, gender responsive leadership, and organizational learning through three interconnected pathways: a discourse guiding organizational practice pathway, a personal/professional pathway, and an academic pathway. Each impact pathway intersects and complements the others to support the realization of outcomes. The key steps in these pathways are illustrated in Figure 1.

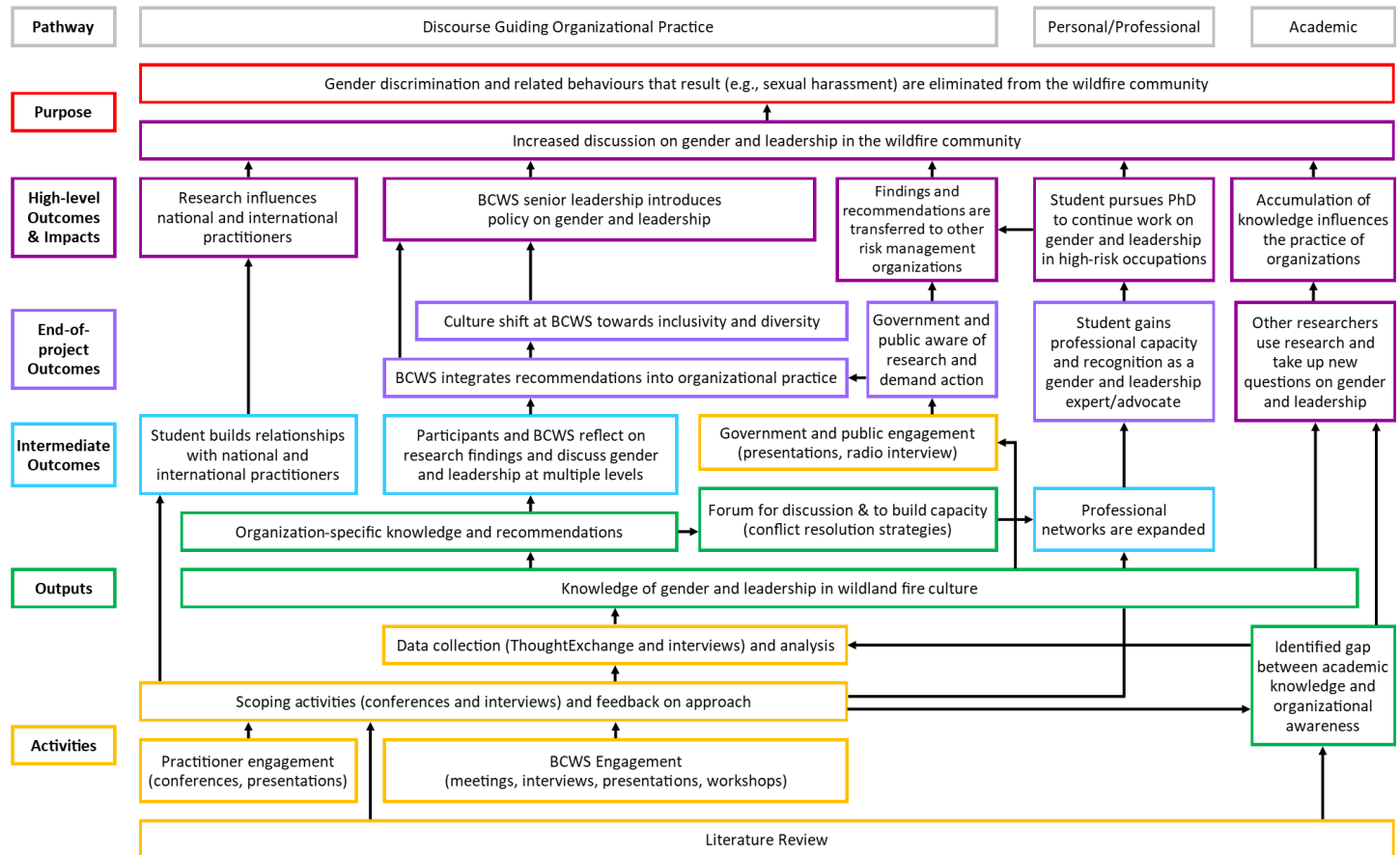


Figure 1. Simplified GLWFP Theory of Change

To influence organizational practice at the BCWS, the PI engaged relevant stakeholders including all levels of the BCWS (from ‘boots on the ground’ to senior management) by leveraging the PI’s existing professional connections due to their own experience of working as a wildland firefighter. The PI shared knowledge and GLWFP findings back to these groups by disseminating via presentations, publications, workshops, and webinars. By participating in the research, it was expected that participants’ self-awareness about organizational culture would be uncovered. The BCWS was expected to recognize gender discrimination as a valid subject for discussion, support gender responsive leadership, and subsequently integrate the GLWFP recommendations into organizational practice. With a culture shift at the BCWS towards inclusivity and diversity as the organization implements recommendations, BCWS’ reputation as a progressive organization would increase to contribute to gender discrimination and related behaviours that result being eliminated from the wildland fire community.

The research intended to provide a personal/professional experience for the PI to expand their capacity and recognition as a gender and leadership expert and continue work on the topic as a consultant and through their subsequent PhD. The PI was expected to expand their professional networks as a result of the GLWFP, which along with developing their professional capacities would lead to their recognition as an expert in the field. The PI was expected to become an advocate to keep gender as a priority for the wildland fire community due to their increased confidence instilled the by GLWFP.

In the academic pathway, the GLWFP findings were disseminated through the publishing of results in peer-reviewed journals and through presentations at conferences to contribute to other researchers becoming aware of the research and taking up new questions on the topic. It is expected that this increased traction in academic discussions would lead to an accumulation of knowledge that influences the practice of the BCWS and other organizations to develop greater receptivity for diversity and inclusivity. Overall, all activities, outputs and outcomes were expected to support gender discrimination and related behaviours that result (e.g., sexual harassment) becoming eliminated from the wildland fire community.

Results

Outcome Evaluation: To what extent and how were outcomes realized?

Table 1 summarizes the extent to which outcomes were realized. The GLWFP leveraged multiple impact pathways and mechanisms to realize outcomes. Outcomes in the discourse guiding organizational practice pathway were partially realized through the involvement of key stakeholders in the data collection process and by creating and strengthening coalitions. As an AR project, the GLWFP identified organizational knowledge and presented evidence-based recommendations which were shared through targeted dissemination of findings (e.g., inclusion of stakeholders in meetings, discussions throughout the research process, formal presentations to the BCWS). Leveraging the PI’s insider status as a wildland firefighter within the BCWS enabled them to gain access to a hard-to-reach population and collect data from the target group. The PI’s reputation was also leveraged to transfer knowledge gained through the GLWFP to the PI’s colleagues at BCWS. The GLWFP contributed to the increased capacity of actors in the system by ensuring that the conversation on gender and leadership is conducted openly and becomes part of BCWS’ practice. Participation in the GLWFP was an empowering experience for participants and acted as an avenue for informal support networks to form. Personal/professional outcomes were realized and supported outcomes in the discourse guiding organizational practice pathway. The GLWFP provided an opportunity for the PI to develop their research capacities, and be equipped with new knowledge, skills, and perspectives to apply in future work within wildland fire and other risk management contexts. Outcomes in the academic pathway were realized via dissemination of GLWFP findings within peer-reviewed publications and conferences, which built awareness of the research among wider research audiences.

Table 1. Summary of outcome realization and GLWFP contributions

Outcome	Assessment
PI builds relationships with national and international practitioners [intermediate outcome]	Realized, clear project contribution
BCWS acknowledges the study [intermediate outcome]	Realized, clear project contribution
Participants’ self-awareness about BCWS culture is uncovered [intermediate outcome]	Realized, clear project contribution
Members of BCWS create informal support network [intermediate outcome]	Realized, clear project contribution
Gender and leadership is a focus of discussion for national and international practitioners [end-of-project (EoP) outcome]	Realized, unclear project contribution
Victims of gender discrimination at BCWS have courage to speak up [EoP outcome]	Partially realized, clear project contribution
BCWS recognizes gender discrimination as a valid subject for discussion [EoP outcome]	Realized, clear project contribution
BCWS discusses gender and leadership (multiple levels) [EoP outcome]	Realized, clear project contribution
BCWS supports gender-responsive leadership [EoP outcome]	Partially realized, unclear project contribution
BCWS integrates recommendations into organizational practice [EoP outcome]	Partially realized, unclear project contribution

Culture shift at BCWS towards inclusivity and diversity [EoP outcome]	Partially realized, unclear project contribution
Provincial government aware of gender discrimination in BCWS and takes action based on recommendations [EoP outcome]	Partially realized, unclear project contribution
Public aware of gender discrimination in BCWS and demands action [EoP outcome]	Insufficient evidence
Public organizations held accountable for transparency around gender discrimination [EoP outcome]	Insufficient evidence
Competencies developed through experiential learning for constructive dialogue around the topic [intermediate outcome]	Realized, clear project contribution
Professional networks are expanded [intermediate outcome]	Realized, clear project contribution
PI gains professional capacity and recognition as gender and leadership expert [EoP outcome]	Realized, clear project contribution
PI becomes an advocate to keep gender as priority for wildland fire community [EoP outcome]	Realized, clear project contribution
Other researchers become aware of the research [intermediate outcome]	Realized, clear project contribution

Few unexpected outcomes were discussed by informants. However, some tensions inevitably rose from the research process of completing action research on a controversial topic. This included the negative reaction to and reception of the research by some male and female firefighters, the personal strain faced by the PI during the research process by working on a contentious topic as a member of the community under study, and the loss of momentum behind GLWFP. The PI underestimated the amount of personal hardship and did not fully anticipate the personal costs of completing the GLWFP. It is important to note that constructive conflict and tension is sometimes necessary to stimulate legitimate change (Lederach, 1995; Bush & Folger, 1994). While the recommendations were national in scope and were developed from BCWS participants' own perspectives, the BCWS has not followed through in the implementation of the recommendations owing to an end in the collaborative relationship with the PI. Although the BCWS did implement policy following the GLWFP, the delivery and implementation was unexpected and resulted in a punitive approach leading to feelings of shame and blame. The logic of the GLWFP and its underlying assumptions appear to be sustained. The GLWFP used an interdisciplinary approach and leveraged the PI's position as an insider to the organization to gain support for the organization, access hard to reach participants, and disseminate knowledge through their established connections to support the realization of outcomes across pathways.

Alternative Explanations of Outcome Realization

Evidence indicates alternative explanations (i.e., processes external to the GLWFP) for outcome realization. For example, the GLWFP was part of a wider BCWS organizational catalyst for change influencing the conversation on culture and gender. Informants discussed both the safe reporting line created by the BCWS to support staff in sharing their experiences within the workplace, and the People First initiative which has contributed to a shift in organizational culture to create a more inclusive and diverse workplace. Parallel with the GLWFP, the BCWS also partnered with the Roy Group to invest in stronger leadership development. Informants suggested that there was focus on the topic of gender and leadership in wildland fire exploring the challenges and barriers faced by female firefighters prior to the GLWFP. Several reports in wildland fire and other land management agencies were released in parallel with the GLWFP that quantified and articulated systemic challenges surrounding gender discrimination in the United States, New Zealand, and Australia, bringing more attention to the topic at the international level. National and international organizations have also focused efforts on issues around gender and leadership within the wildland fire community including the Women's Prescribed Fire Training Exchange (WTREX) and the creation of recommendations by the Canadian Interagency Forest Fire Centre (CIFFC) to increase the awareness of issues around gender discrimination. There have also been high-profile cases within British Columbia (BC) regarding discriminatory factors surrounding firefighter fitness tests which were taken to

the Supreme Court of Canada. An increase in the wider cultural understanding of the topic, including through the #MeToo movement has renewed focus on the topic at the societal level. In the academic pathway, there are other scholars exploring gender in wildland fire contexts that are contributing to the research agenda.

Project Assessment: What elements of the research design and implementation supported outcome realizations, and how?

The QAF assessment reveals that the GLWFP's design and implementation aligns with some principles and criteria of relevant, credible, and legitimate research that is positioned for use, and produced knowledge that is useful and used (see Appendix 5 for QAF results and justifications for the project assessment).

Under the relevance principle, the PI's position as an insider to the organization was a key factor in supporting the completion of research on a sensitive topic. The GLWFP also effectively engages with the problem context with a breadth and depth of understanding as a result of the PI's previous experience as a former wildland firefighter and crew leader. The GLWFP addressed a socially relevant research problem by supporting the BCWS to deliver on its strategic goal of excellence in people, and undertaking the research at a time of interest in the experiences of female firefighters and gender in the wildland fire community. However, the GLWFP does not utilize an explicit ToC which likely would have supported critical thinking and collective visioning among target audiences and facilitated transparency and accountability of results. GLWFP results used overly academic language; the use of more appropriate terminology would have improved the accessibility of results among target audiences.

Regarding credibility, the GLWFP's design and resources were appropriate to carry out the research. The support and sponsorship from the BCWS as well as the inquiry team supported the feasibility of the research project in terms of having adequate social capital to garner participation in the project. The GLWFP reviews and integrates a breadth and depth of literature and theory from relevant disciplines including leadership studies and gender studies, conveying and understanding from multiple disciplines revealing the projects interdisciplinarity. However, a singular objective for the project was documented; a better formulation of objectives would have aided the structure and purpose of the project. A more thorough exploration of the dissonance in findings would have also supported the defensibility and credibility of the arguments presented.

Under legitimacy, the GLWFP received ethical approval by RRU Research Ethics Board and a section of the GLWFP documentation is dedicated to ethical issues and power dynamics within the context of the research, showing an in-depth understanding and prioritization of ethics. A range of system actors were involved in the research, including representation of all levels of the BCWS, and efforts were made to include and enable diverse perspectives to participate. GLWFP documentation discusses the PI's positionality and briefly acknowledges the implications for the findings, although this could have been expanded upon to support disclosure of perspective. Full transparency of positionality and how this affected the interpretation of results would have improved the research and intended audiences' trust in and use of the research findings.

The GLWFP clearly contributed to the partial or full realization of eleven of the nineteen intermediate and EoP outcomes. The GLWFP resulted in positive outcomes for individuals and was a catalyst for the BCWS to focus on the topic of gender, despite challenges that arose. However, the extent of organizational changes remains unclear with no official engagement in terms of a strategy or policy change following the completion of the GLWFP. The GLWFP also contributed to shifting existing power dynamics, as some participants had their experiences acknowledged and validated through the research experience. The PI learned lessons from the GLWFP in terms of how to stimulate change within the wildland fire context and became a better leader in practice. The PI has transferred these problem-solving skills to other aspects of their professional life, including their doctorate. The GLWFP also contributed to the PI's personal knowledge on the topic, although the extent to which system actors' knowledge gaps were filled is unclear.

Evidence indicates RRU programming supported the realization of GLWFP outcomes in the personal/professional and discourse guiding organizational pathways. The interdisciplinary nature of the program enabled the PI to draw on literature from diverse disciplines, complete research that was relevant to their role as

a wildland firefighter, and learn how to implement change through a research process. The RRU MAL program offers distanced learning which supported the PI in continuing to stay connected in the rural context of wildland firefighting and maintain a collaborative relationship with firefighters. The MAL program positively influenced the GLWFP and enabled the PI to create a robust research methodology that provided data that could be triangulated to get to the core of issues surrounding the topic of gender and leadership in wildland fire. The PI gained encouragement from the program, and relied on the MAL's training which enabled the PI to engage with research participants using an approach that acknowledged the researcher as a leader in their own right.

Lessons Learned

Project Lessons

- Leveraging the PI's position within the organization and social capital were effective strategies to collect data and ensure knowledge-to-practice through dissemination.
- Aligning the research with current initiatives and organizational strategy means the research is better positioned for use.
- Engaging all levels of system actors as participants (e.g., 'boots on to ground', government actors, and senior leadership) in the development of recommendations fosters the relevance of outputs.
- Strategically leveraging partnerships with organizational leaders and leading academics supports the acknowledgement of the research and fosters organizational change. Organizational buy-in for the GLWFP was crucial to its success in gathering data from a hard-to-reach population and fostering support for recommendations. Sponsoring organization relationships should be managed carefully to gain access, support, resources, and networks.
- Utilizing an interdisciplinary approach supported the GLWFP in building a bridge between academic and practitioner spheres.
- Effective communication, particularly regarding methods and the expectation for change after the presentation of results, is key to stimulate and sustain action from the research. Perception of research agenda and researcher positionality can lead to skepticism of research findings and diminish the likelihood for application of outputs and can also create tension.

Contextual Lessons

- Leveraging insider knowledge allows access to hard-to-reach participants and offers an understanding of internal organizational cultural dynamics.
- Gender and leadership in wildland fire are complex issues, and exploration into the topic can lead to tensions if collaborative relationships are not managed throughout the research process. Full transparency and positionality should be discussed and reflected upon in detail throughout the project to avoid research being perceived to have a predetermined direction. When doing further research within this context, it is suggested that a wider lens of inclusivity should be used to minimize perceptions of bias.
- Due to the traditional focus on natural science within this context, future research should expose audiences to the value of social sciences and leadership studies to support the effective functioning of risk management organizations.
- Providing meaningful data on a topic that is grounded within the local context is more likely to raise attention to the issue and encourage action.
- For research to be both useful and used by target audiences, it must be presented in accessible formats. The use of more appropriate terminology would have improved the accessibility of results throughout the organization.

Evaluation Limitations

Limitations of the analytical framework: Having the PI identify informants to test the outcomes can also increase the risk of introducing bias into data collection as informants may be selected for their likelihood to reflect

positively on the project's results and outcomes. To address this limitation, snowballing for additional perspectives and sources of information was undertaken.

Limitations of the data and results: Assessments using the Outcome Evaluation approach rely on informant perspectives. Interviews were conducted a few years after the project concluded, making recall of project details and processes difficult for informants. Some informants struggled to draw connections between contributions made by the GLWFP and other initiatives underway within the BCWS related to gender and leadership. This led to several outcomes being assessed to have unclear project contributions. However, informants that have continued to have a close working relationship with the PI could recall more details of the project and its contributions. As there have been few discussions on the topic of gender and leadership in wildland fire within Canadian media, outcomes relating to public perceptions had insufficient evidence to make an assessment.

Recommendations

Considering the results of the case study evaluation, we propose the following recommendations for the design and implementation of future research projects on gender and leadership in risk-management organizations:

1. Align research with a clearly defined academic, political, and organizational problem to position outputs for use. Aligning research with the organization's strategic direction will support implementation and uptake.
2. Leverage strategic partnerships and actively seek collaboration with relevant actors and boundary partners to foster organizational change through gaining access to data, support for the project, and supporting dissemination and outreach.
3. Tailor communications to target audiences and use language that is appropriate for target audiences to ensure the uptake and use of findings to ensure the effectiveness of the message.

For solutions-oriented research projects:

1. Use a ToC to plan and monitor progress and identify boundary partners that will support intended outcomes.
2. Develop research objectives that aid the structure and purpose of the research project. A set of clearly defined objectives provide a clear direction and scope of the research.
3. Discuss alternative explanations and limitations (including bias) in relation to effect on results to support rigour and transparency.