

**MENTAL HEALTH PERCEPTIONS OF RURAL COMMUNITY MEMBERS  
AND FIREFIGHTING PERSONNEL AFTER A WILDFIRE**

**AINSLEE KIMMEL**

B.A. in Psychology (with Distinction), University of Victoria, 2003

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## **Abstract**

Wildfires in Canada and around the world are increasing in frequency each year from factors such as accumulated fuel load, climate changes, and pine beetle infestation. Due to an increased proportion of individuals living in the wildland–urban interface areas within Canada and due to the increasing need for firefighters to fight the growing number of fires that burn each year, the potential threat for humans is also becoming greater. Conducted on the 2009 West Kelowna, British Columbia wildfires, this descriptive, exploratory, qualitative study incorporates quantitative validity measurements to investigate factors related to individual variations in psychological distress and posttraumatic growth (PTG). The findings revealed that perception of control, social support, compounding stressors (i.e., dual roles, ongoing responsibilities and personal issues), and coping methods (i.e., debriefing, humour, self-care behaviours, and reflection) were precursors to psychological health and resilience. Since wildfires are increasing in Canada as well as on a global scale, understanding how they affect residents and firefighting personnel from a mental health perspective is important to research, as it can lead to identifying more effective interventions, better provision of disaster relief services, and increase individual resilience.

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## Chapter 1: Introduction

Natural disasters occur in many different forms including floods, earthquakes, fires, and tsunamis, yet they can be equally traumatic for the individuals that experience them. Even if deaths or injuries do not result, the psychological impacts of surviving a disaster can be pervasive and last for many years after the event (Norris, Friedman, & Watson, 2002). Increasingly, wildfires are reported in the media as common occurrences. In forested areas of Canada, wildfires occur on a regular basis and are rising in number each year from factors such as accumulated fuel load, climate changes, and pine beetle infestation (Canadian Council of Forest Ministers, 2010; Filmon, 2004; Natural Resources Canada, Canadian Forest Services [CFS], 2005). Due to an increased proportion of individuals living in the wildland–urban interface areas within Canada and due to the increasing need for firefighters to fight the growing number of fires that burn each year, the potential threat for humans is also becoming greater (Government of British Columbia, Ministry of Forests and Range, 2010).

Since the number of fires experienced across Canada rises every year (CFS, 2005), and overall disasters are increasing worldwide, there has been a call by relief organizations such as the Red Cross to investigate causes of individual vulnerability and resilience to disaster in the hopes of identifying more effective interventions (Walter, 2004). Additionally, psychological factors are inextricably linked to people's ability to successfully overcome the socioeconomic adversity resulting from disasters (Tremblay, Blanchard, Pelletier, & Vallerand, 2006). Several studies have found that “levels of psychopathology are inversely related to survivor's [*sic*] perceptions of the adequacy of provision of government and other social support (Deković, Koning, Stams, & Buist,

2008; Norris & Kaniasty, 1996; Suar et al., 2002)” (Mellon, Papanikolau, & Prodromitis, 2009, p. 190). Therefore, it is important to determine mitigation strategies that are suitable for contending with the distress caused by disasters and resource loss. This thesis reports on a study on mental health in both residents and firefighting personnel from a context of perceived symptoms of posttraumatic stress disorder (PTSD), which is a clinical anxiety disorder that can result after a traumatic experience (Morrill et al., 2008), and symptoms of posttraumatic growth (PTG), which Morrill et al. (2008) defined as “positive change or benefit finding resulting from trauma” (p. 948). This thesis was conducted on the 2009 wildfires that occurred in West Kelowna, British Columbia (BC); this site was chosen because it provided the opportunity to examine the identified phenomena among residents and professional firefighters alike who have experienced a more recent fire (i.e., within the last 5 years) and have not been involved in another investigation, thereby reducing participant burden.

For this study, addressing mental health from both a positive and negative perspective was imperative, since “dysfunction cannot be fully understood without a deeper understanding of health and resilience” (Bonanno, 2004, p. 26). Moreover, because some aspects of PTG do not become apparent until months or years after a traumatic event (Tedeschi, Park, & Calhoun, 1998), West Kelowna was an ideal location to look for positive affect and growth among participants, since it has been over one year since the fire. Further, Norris et al. (2002) found that negative psychological symptoms tend to peak around one year and then slowly abate. West Kelowna residents would hopefully be in this transition phase, in order to observe a cross section of different levels of coping. Finally, PTG and PTSD outcomes following disaster are not always mutually

exclusive (Paton, Smith, & Violanti, 2000; Tedeschi & Calhoun, 1996); previous literature asserted that psychological growth does not necessarily remove negative outcomes, but rather acts as a protective buffer against them (Morrill et al., 2008). Therefore, further research must study both conditions simultaneously in order to understand the interaction between them (Paton et al., 2000).

This research project emerged from the findings of a recently completed mixed-methods study examining the impacts of wildfires on community resiliency after the 2003 McLure Fire (Kulig, Reimer, Townshend, Edge, & Lightfoot, 2011). This study revealed the existence of mental health issues such as symptoms of anxiety and depression (Kulig et al., 2011). The McLure fire destroyed a total of 90 structures, homes, and businesses including the Tolko logging mill—a main source of employment for the area where approximately 75% of individuals are directly or indirectly dependent on the forest industry for income (Kulig, 2006). Although the wildfire occurred in 2003, the communities are still struggling with the aftermath of the disaster, including financial and economic instability and unemployment (Kulig, 2006). Given that resource loss was found to be the highest predictor of psychological distress after disasters (Jones, Ribbe, Cunningham, Weddle, & Langley, 2002) and that chronic stress leads to more depressive symptoms (Stimpson, 2006), it is no surprise that mental health issues exist within this rural area.

Alternatively, individuals within the qualitative interviews of Kulig et al.'s (2011) recently completed study also expressed the remarkable resilience exhibited by the communities' residents. Study participants mentioned positive benefits as a result of the

fire such as bringing people closer together and stimulating a renewed appreciation for life.

### **Main Concepts**

In this research, there are several main concepts that are being addressed:

*Disaster* is defined as “a severe disruption which is both ecological and psychosocial which greatly exceeds the capacity of the affected community” (The World Health Organization, as cited in Bhugra, 2005, p. 195).

*Mental health* is defined as

a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community. In this positive sense, mental health is the foundation for individual well-being and the effective functioning of a community. (World Health Organization, 2010, para. 8)

*Posttraumatic growth* (or PTG) refers to

the positive changes individuals may experience following a traumatic event. For example, following a traumatic event, some people report positive changes in their goals, priorities, relationships with others, and spirituality as a result of re-evaluating or modifying their assumptions about the world and their life. (Tull, 2009, Definition section, para. 1)

*Posttraumatic stress disorder* (or PTSD) “is an anxiety problem that develops in some people after extremely traumatic events, such as combat, crime, an accident or natural disaster” (American Psychological Association, 2012, para. 1). “People with PTSD may relive the event via intrusive memories, flashbacks, and nightmares; avoid

anything that reminds them of the trauma; and have anxious feelings they didn't have before that are so intense their lives are disrupted" (American Psychological Association, 2012, para. 2).

*Resilience* is "the ability to recover quickly from illness, change, or misfortune; buoyancy" ("Resilience," 2012, para. 1).

*Wildland-urban interface (or WUI)* is "the area where structures and other human development meet and intermix with wildland areas containing flammable vegetation (trees, brushes, grasses)" (Ministry of Forests & Range, Ministry of Public Safety & Solicitor General, Emergency Management British Columbia, Provincial Emergency Program, & Office of the Fire Commissioner, 2008, p. 8).

### **Significance of the Research**

The significance of this research lies in the opportunity to conduct Canadian-based research on a topic that has been poorly explored. Given the increase in natural disasters and the lack of information about individual response to such events, the links to mental health status and the impacts on mental health services, generating information about this topic is necessary. Finally, the move toward resilience and PTG as a framework for disaster services and research provides further impetus for the significance of the research.

### **Purpose of the Proposed Research**

The purpose of this research was to determine factors that are related to individual variation in psychological health and resilience after a wildfire. An additional aim was to uncover potential factors linked to why certain individuals never fully recover from a wildfire, others return to their normal level of psychosocial functioning, and yet others

derive meaning and grow as a result of their experience (Joseph & Linley, 2005; Woodward & Joseph, 2003).

### **Research Questions**

The research questions for this thesis were:

1. What psychosocial factors are linked to individual variations in psychological health and resiliency after the experience of a wildfire?
2. Despite experiencing similar circumstances:
  - What factors are linked to individual variations in psychological distress after a wildfire and why might these differences exist?
  - What factors are linked to individual variations in psychological growth after a wildfire and why might these differences exist?

For this exploratory research, qualitative descriptive methods with overtones of phenomenology and grounded theory were used (Sandelowski, 2000a). The next chapter will focus on the existing literature that served to inform the research questions.

Canadian wildfire research is underresearched—particularly wildfire research that investigates the psychological impacts of a wildfire on community residents. Existing research on these topics, along with other pertinent themes related to this thesis research, will be discussed. Following the presentation of the literature, Chapter 3, will focus on the research design, data collection, and analysis; Chapter 4 will report the study findings within the context of four major themes. The thesis culminates in Chapter 5, which will provide the discussion of the meaning of the findings generated through this study.

## **Chapter 2: Background – Literature Review**

After performing an exhaustive literature search using multiple search engines and numerous relevant keywords, this researcher found no research that specifically investigated the topic of this thesis. This was unsurprising, since the amount of Canadian wildfire research on resilience and psychological distress is limited. For this reason, it was necessary to review research findings on a broader scale. For instance, the literature review will discuss several interrelated topics, including research findings on the psychological impacts of disasters within an international context. Additionally, the literature review will provide an in-depth examination of more specific topics that more closely align with the research questions of this thesis. Examples include discussing wildfires in Canada and then moving on to discuss the negative psychological effects of wildfire for both firefighting personnel and rural community members.

### **Natural Disasters and Disasters**

Natural disasters have been increasing over the last two decades—both on a national and global scale (Walter, 2004). The United Nations (2007) defined a disaster as “A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources” (Disaster section, para. 1). Disasters are unlike other traumatic events in that they can threaten or upset entire communities (Tremblay et al., 2006). The difference between natural disasters and other disasters is that natural disasters involve natural forces (“Natural Disaster,” 2009), and do not usually occur from a direct result of human beings; some examples include wildfires, earthquakes, and floods (Briere & Elliot, 2000).

Humans can be the cause of natural disasters as well; however, other more natural predisposing factors are usually present, which serve to increase the probability of the disaster occurring. For example, although the 2003 McLure fire was technically caused by improper extinguishing of a cigarette, the dry conditions and high temperatures were ideal conditions without which the fire would never have become so devastating.

Nonnatural disasters “include technological or human-caused events (e.g., toxic spills, nuclear accidents) and large-scale transportation accidents (e.g., plane crashes, shipwrecks)” (Briere & Elliot, 2000, p. 661).

Not all disasters involve injury and loss of life; however, the most devastating effects resulting from disasters are often community resource loss, ranging from communication, transportation, or entire infrastructures (Tremblay et al., 2006).

Developing countries are most affected by natural disasters because they lack the resources to effectively rebuild afterwards (Norris et al., 2002). Developed countries such as Canada have governmental aid and insurance to help communities return to a “pre-disaster condition” (Sandink, 2009, p. 49), yet disasters still place considerable psychological and financial stress on communities. A recent article on strategies for protecting Canada’s critical infrastructure published by Public Safety Canada (2009) stated:

As the rate and severity of natural disasters increases, so does the possibility that disruptions of critical infrastructure could result in prolonged loss of essential services. The risks and vulnerabilities are heightened by the complex system of interdependencies among critical infrastructure, which can lead to cascading effects expanding across borders and sectors. The implications of these

interdependencies are compounded by society's increasing reliance on information technologies. (p. 4)

In other words, the fact that countries are developed through enhanced technologies and partnerships with other developed countries poses unique risks in their own right. Since Canada is heavily dependent upon infrastructure that can be destroyed by a natural disaster, residents are vulnerable for being left without essential services during the evacuation period but also during the recovery period which may extend for a prolonged period of time. Further disaster implications for Canada will be discussed in the following section.

### **Disasters in Canada**

In Canada, the provincial and territorial governments are responsible for legislation (i.e., developing and implementing provincial and municipal multiagency hazard plans) and for providing emergency response and recovery assistance to municipal governments. The federal government organizes and funds joint disaster programs across the country, such as the Joint Emergency Preparedness Program (Public Safety Canada, 2009). However, municipal governments often have the largest role, since they provide direct assistance to postdisaster communities (Public Safety Canada, 2009). Practically speaking, "local governments are in the best position to mitigate disasters" (Sandink, 2009, p. 42) since they possess local knowledge of hazards and vulnerabilities.

If the disaster overwhelms the community, then resources from the provincial and federal governments are accessed and put in place. However, the actual process for such a response, although understood from a policy perspective, is not always as clear from an "on-the-ground" perspective, particularly in relation to wildfire disasters.

Ironically, municipal governments often have the least amount of resources in which to provide assistance. Further, although Canadian and BC law states that all regional and municipal districts must have a disaster plan, (Emergency Program Act, 1996) it is unclear how up-to-date these plans are since the Emergency Program Act (1996) for Local Authority Emergency Management Regulation stated the following:

A local authority must, as part of the local emergency plan prepared by it under section 6 (2) of the Act, (a) require a periodic review and updating of the local emergency plan and establish a procedure for that review and revision. (Section 3, para. 1–2)

Since “periodic” is a vague timeframe, it is unclear how often these plans are revised and updated. Therefore, municipal government disaster plans may not be current or focus on risk reduction. Although this trend is changing, as Canada is focusing on more nationwide as well as international programs for disaster recovery and mitigation (Public Safety Canada, 2009; United Nations, 2010).

Mitigation challenges are factors such as the high costs associated with mitigation, climate change, and the lack of long-term public interest or commitment to mitigation planning (Sandink, 2009). Some barriers for effective disaster recovery in Canada include: poorly developed disaster recovery plans, residents’ lack of property insurance, and the high costs associated with recovery (Kulig et al., 2011). In addition, when employment structures are permanently destroyed many residents are suddenly unemployed and families and communities suffer financially. However, Canada is working towards reducing some of these barriers. Canada’s *National Strategy for Critical Infrastructure* (Public Safety Canada, 2009) “is to build a safer, more secure and

more resilient Canada” (para. 1) by improving communication and enhancing partnership between the federal, provincial, and municipal governments as well as implementing an all-hazards risk management approach. Part of the national strategy is to adapt mitigation tactics that take climate change into account (Sandink, 2009). Further, the federal government’s aim is to reduce disaster recovery and mitigation costs by adopting a more collaborative and open approach to communicating between the three levels of government (Public Safety Canada, 2009; Sandink, 2009).

### **Wildfires**

Wildfires are natural disasters that occur in all parts of the world. In 2009, the Food and Agriculture Organization of the United Nations (as cited in Government of British Columbia, Ministry of Forests, Lands, and Natural Resources Operations [BC Ministry of FLNRO], 2010) reported that fires “contribute to global warming, air pollution, desertification and loss of biodiversity” (p. 5) and are increasing on a global level (CFS, 2005). Areas that are the most heavily impacted by wildfires include Ethiopia, South Sudan, California, and Australia (BC Ministry of FLNRO, 2010). Not surprisingly, developing countries are also the most negatively impacted and take significantly longer to recover after a wildfire (BC Ministry of FLNRO, 2010).

Even in developed countries, fires take a considerable toll on communities, and the imminent dangers do not just pertain to injury or death—wildfires destroy homes, businesses, and critical forestland (CFS, 2005). The social costs of wildfires are many, including negative impacts on the economy, public health, and infrastructure (BC Ministry of FLNRO, 2010). Therefore, emotional trauma and psychological symptoms experienced after a wildfire are commonly reported and are independent of injury or

death (Jones et al., 2002; Joseph & Linley, 2005; McFarlane, Clayer, & Bookless, 1997; Mellon et al., 2009; Stimpson, 2006; Tang, 2006; Tremblay et al., 2006). There is also distress caused by the consequences of the fire such as contending with relocation and the loss of property, employment, and community support (BC Ministry of FLNRO, 2010; CFS, 2005).

### **Canadian Wildfires**

Wildfires are one of the most common natural disasters in Canada and their occurrence is projected to rise as a result of climate change and increased vulnerability of forests due to insect infestation, such as the pine beetle infestation (Natural Resources Canada, Canadian Forest Service, 2005); on average, 8,600 fires burn annually—burning approximately 2.5 million hectares in land (BC Ministry of FLNRO, 2010). Not attributing for the associated costs of fire damage, the estimated yearly costs of putting out fires alone ranged between \$400 million and \$1 billion in 2009 (BC Ministry of FLNRO, 2010). Furthermore, with an influx of people moving to wildland-urban interface regions—“area[s] where houses meet or intermingle with undeveloped wildland vegetation” (USDA Forest Service: Southern Center for Urban Forestry Research & Information, 2004, p. 1)—individuals’ risks are only increasing (Kulig, 2006; Marshall, Schell, Elliott, Rayburn, & Jaycox, 2007; Natural Resources Canada, Canadian Forest Service, 2005). The Wildland Fire Management Working Group (2010) found that “in Canada an average of 20 communities and about 70,000 people are threatened by large fires annually and an average of 5,500 people are evacuated from 10 communities per year” (p. 5).

To contend with the rising occurrence of wildfires and the associated cost of extinguishing them, the Canadian government has spent millions of dollars creating and improving disaster plans as well as developing more effective mitigation strategies (Sandink, 2009). However, often municipal wildfire planning remains inconsistent. A case in point is the municipality of Langford, BC, which created a by-law for homeowners to implement FireSmart practices (“When Wildfires Strike,” 2009). The community of Kelowna has also incorporated wildfire risk-management strategies within their community. Many of these strategies have been developed as a result of some devastating wildfires in BC, as discussed in the next section. However, these proactive communities “are the minority in Canada” (Feller, as cited in “When Wildfires Strike,” 2009, Reducing the Risk section, para. 8); most municipalities have not adopted these types of risk-reduction policies in regards to wildfire that incorporate strategies from programs like FireSmart for homeowners.

### **British Columbia Wildfires**

BC is one of the provinces more significantly impacted by wildfires in Canada. Particularly notable years include the legendary firestorms of 2003 (Filmon, 2004) and, most recently, the summer of 2009 (BC Ministry of FLNRO, 2010). The direct costs of extinguishing wildfires in 2003 and 2009 were \$377 million and \$403 million, respectively (BC Ministry of FLNRO, 2010). Moreover, the 2009 fires were comparable in size to 2003 with a total of 242,170 hectares burned, which is only slightly less the 266,860 hectares that burned in 2003 (BC Ministry of FLNRO, 2010). However, the major difference between these two years was the loss of property. The 2003 fires destroyed hundreds of homes and other buildings, while only seven homes were lost in

BC in 2009 because of the fires' trajectories and the fact that the fires were contained before reaching wildland-urban interface areas (BC Ministry of FLNRO, 2010). These wildfires, particularly the ones resulting in property loss, deeply affected BC residents and the involved firefighting personnel. The next few sections discuss international research findings examining the psychological impacts of disasters and wildfires. It begins with a review of the negative psychological effects of disasters in general.

### **Negative Psychological Effects of Disasters**

There is a vast body of international research investigating the negative psychological effects of disasters. Since there is significantly less research that specifically addresses wildfires, it was deemed necessary to expand this literature review to encompass disasters in general to ensure that the most valid and reliable data were included. This research was conducted in countries such as Australia, the United States, the United Kingdom, China, Greece, and Canada; the findings from all of this research indicated that natural disasters could have lasting psychological effects that persist long after the crisis has been averted (Jones et al., 2002; Joseph & Linley, 2005; McFarlane et al., 1997; Mellon et al., 2009; Tang, 2006; Tremblay et al., 2006). PTSD symptoms occur most commonly, and include "re-experiencing of the trauma, numbing of affect and avoidance of trauma-related stimuli, and symptoms of excessive arousal not present before the event" (Heinrichs, Wagner, Schoch, Soravia, & Hellhammer, 2005, p. 2276). However other symptoms such as anxiety and depression (Stimpson, 2006), phobias, loss of affect, grief reactions, ruminations, and guilt are experienced by individuals as well (Nolen-Hoeksema & Morrow, 1991).

*Disaster Traumatic Stress Response* (DTrS) is a recent emerging term in the literature that was first discussed by Erwin R. Parson (n.d.), a researcher and mental health clinician from the United States, after the occurrence of the 9/11 disaster. Parson stated that DTrS “encompasses Post-Traumatic Stress Disorder, but goes beyond it to include other trauma-based human responses not covered by the PTSD diagnosis” (p. 3). For instance, Parson explained that DTrS involves other human reactions in addition to PTSD symptoms, which affect social, political, economic, and ethnocultural areas. Types of DTrS symptoms include: biological-based symptoms (e.g., gastrointestinal distress, body aches and pains, elevated blood pressure, increased levels of cortisol and norepinephrine, etc.); psychologically-based symptoms (e.g., anxiety, depression, guilt, feelings of emptiness, difficulty making decisions, apathy, distrust, etc.), and behaviourally-based symptoms (e.g., social isolation, increased interpersonal conflict, intimacy avoidance, reduced sense of community, etc.). DTrS includes many other symptoms, the majority of which will be discussed below. However, this term is still relatively new and has not been empirically researched or widely disseminated within the disaster literature. For these reasons, the term will not be used throughout this thesis, although it holds potential for widespread applicability, which suggests that it may be beneficial as a term and/or psychological criterion that can be designated specifically for disaster survivors. The next two studies that are discussed focus on sense of control and disaster response styles.

Stimpson (2006) conducted a quantitative study in Texas, United States of America (US), regarding an individual’s sense of control and depressive symptoms following a flood. Stimpson surveyed 1,735 individuals and discovered that a reciprocal

relationship exists between a decreased sense of control and increased depressive symptoms; that is, “sense of control was negatively associated with change in depressive symptoms, and depressive symptoms were negatively associated with change in sense of control” (p. 161). Stimpson’s study findings validated cognitive theorists’ beliefs about coping ability and sense of control; these theorists maintain that psychological adjustment is related more to the individual’s appraisal of risk and not necessarily the risk itself. In other words, “one’s personal beliefs about control, whether general or specific, illusory or realistic, influence how that event is appraised, and through appraisal subsequent coping activity” (Lazarus & Folkman, as cited in Prince-Embury, 1992, p. 39).

A particularly unique quantitative study examined disaster and response style. Nolen-Hoeksema and Morrow (1991) obtained prepsychological measures of 250 undergraduate students before an earthquake. These researchers found that higher levels of PTSD symptoms were found in individuals with more ruminative response styles (Hoeksema & Morrow, 1991). Further, Hoeksema and Morrow reported that individuals with preexisting emotional health issues reported more PTSD and depression symptoms than other participants that were more high-level functioning before the earthquake.

Other responses noted after a natural disaster include behavioural and physiological disturbances such as interpersonal problems, impaired concentration, sleep disturbances, and anhedonia or lack of pleasure (Tremblay et al., 2006). This quantitative Canadian study was conducted with undergraduates at a Montréal university after the 1998 ice storm (Tremblay et al., 2006). The results indicated that perceptions of stress and life vitality were the most important predictors of somatic symptoms and psychological distress (Tremblay et al., 2006). High life stress was correlated with

increased physical and psychological symptoms whereas higher measures of life vitality negatively predicted these same symptoms (Tremblay et al., 2006).

A second quantitative study on individual perception conducted in the United Kingdom found that after a disaster (natural or man-made) individuals who reported feeling small and powerless were often left with pervasive feelings of uncontrollability and helplessness that impinge on other areas of their lives (Linley & Joseph, 2004). Previous findings from a US study determined that stress experienced from disasters is correlated with increases in suicides, deaths, strokes and heart attacks (Stimpson, 2006).

The psychological implications of disasters (both man-made and natural) have received increasing attention over the past decade; however, very few research studies have been conducted in Canada. What is more, the few studies that have been conducted are quantitative and not qualitative in nature. In general, there is controversy surrounding international research results. Findings are inconclusive and some studies directly contradict previous conclusions (McFarlane et al., 1997; Wang et al., 2000). For instance, a number of researchers found that psychological distress experienced after disaster is low and temporary, while other researchers maintain that psychological effects are often extreme and frequently become chronic conditions (Jones et al., 2002). This could be due to several different factors such as the varying samples that were used for the studies (i.e., undergraduate students vs. the general population), the different types of disasters that have been studied (i.e., earthquakes vs. floods), or the living standards of study's country of origin (developed vs. nondeveloped). However, more research needs to be conducted to ascertain the reason for these contradictions.

Some indications of these differences were found to be dependent upon situational factors such as the level of exposure to the event, the proximity of the individual to the epicenter of the disaster, and the degree of loss following the event (Jones et al., 2002; Mellon et al., 2009). Psychosocial variables include the age and gender of the individual, the types of coping strategies used, and the amount of social support received. More specifically, poorer outcomes are predicted when individuals are closer to the epicentre of the disaster; have more traumatic exposure to the disaster; are older; exhibit avoidant-based coping strategies; and experience post-disaster life events such as loss, relocation, and inadequate social support (Morrill et al., 2008; Tang, 2006). Particular personality factors have also been linked to a more negative adjustment following disaster. These include neurotic or introverted personality, low self-concept, and pessimism (Tang, 2006).

Korol, Green, and Gleser (1999) hypothesized that four main factors interact to decide both short- and long-term psychological effects. The four factors are: “a) characteristic of the stressor (i.e., loss, life threat), b) cognitive processing of the event (i.e., magical thinking), c) individual characteristics (i.e., age, gender), and d) characteristics of the environment (i.e., reactions of family members)” (Korol et al., as cited in Jones et al., 2002, p. 165). Despite all of the findings discussed here, inconsistencies concerning the psychological impact of disasters indicate a need for continued research in this area.

### **Resilience and Posttraumatic Growth**

Alternatively, Mellon et al. (2009) indicated that other researchers, such as Bonanno (2004) “have questioned whether the resilience of trauma victims might be

extensively underestimated” (p. 190). Morril et al. (2008) reported that throughout a range of documented traumatic events a large majority of people have been able to cope effectively and do not develop psychopathology. In fact, some individuals even report experiencing positive life changes and personal growth following trauma. Joseph and Linley (2005) discussed how this reaction to adversity has been labelled various terms within the literature, such as:

- Posttraumatic growth (Tedeschi & Calhoun, 1996)
- Stress-related growth (Park, Cohen, & Murch, 1996)
- Perceived benefits (McMillen & Fisher, 1998)
- Thriving (Abraido-Lanza, Guier, & Colon, 1998)
- Positive changes in outlook (Joseph, Williams, & Yule, 1993)
- Transformational coping (Aldwin, 1994)
- Construing benefits (Affleck & Tennen, 1996)
- Heightened existential awareness (Yalom & Lieberman, 1991)
- Quantum change (Miller & C’deBaca, 1994)
- Positive by-products (McMillen & Cook, 2003)
- Flourishing (Ryff & Singer, 1998)

All of these terms can be used interchangeably, but will be referred to as posttraumatic growth (PTG) in this study. PTG has been studied in people who have experienced sexual abuse (Woodward & Joseph, 2003), bereavement, cancer, disease (Joseph & Linley, 2005), as well as disasters such as earthquakes (Tang, 2006) and floods (Gwimbi, 2009). However, because it is such a new topic, the number of studies that exist on PTG is far less than research conducted on PTSD. Moreover, even less research specifically investigates PTG and disasters, particularly wildland-urban interface fires

(Marshall et al., 2007). Due to the fact that the literature is insufficient to identify variables that differentiate PTG from an illness event such as cancer versus PTG postnatural disaster, all of the studies and factors that lead to PTG will be discussed and considered here.

PTG extends beyond individual resilience—“the ability to maintain a stable equilibrium” (Bonanno, 2004, p. 20)—to encompass positive changes in psychological well-being (Morrill et al., 2008; Pat-Horenczyk & Brom, 2007; Paton et al., 2000; Tang, 2006; Tedeschi et al., 1998a; Tremblay et al., 2006; Woodward & Joseph, 2003). According to Joseph and Linley (2005) and Woodward and Joseph (2003), people who experience PTG report improvements in three areas of their lives: (a) their interpersonal relationships (i.e., closer and more profound); (b) their views of themselves (i.e., as stronger and more empowered individuals); and (c) their worldviews (i.e., living a more purposeful life and making every day count). The Posttraumatic Growth inventory (PTGI) that is used in an attempt to measure PTG expands on this concept by adding two additional categories: spiritual change and new possibilities (Tedeschi & Calhoun, 1996; Tedeschi, Park, & Calhoun, 1998b). These new categories encompass experiencing spiritual growth or a newfound affinity for spiritual matters and experiencing an increased willingness to try new things, or change old, unhelpful ways of living, respectively.

Increased interest in PTG over the last decade has generated a surge of empirical research in this field (Heisel & Flett, 2008; Joseph & Linley, 2005; Pat-Horenczyk & Brom, 2007; Morrill et al., 2008). PTG in some studies has been found to occur in individuals who are generally more optimistic, experience higher levels of positive affect,

are of female gender, and are younger in age (Heisel & Flett, 2008; Joseph & Linley, 2005; Linley & Joseph, 2004; Tang, 2006).

Other personal characteristics linked to PTG include extraversion, openness to experience, and self-efficacy (Tang, 2006). Further, people who display PTG are more likely to exhibit coping patterns that focus on problem solving and/or positive reappraisal. Researchers have also noted that individuals who experienced a more extreme trauma often reported the greatest levels of PTG (Morrill et al., 2008).

Researchers have called for future studies in this area since findings are inconsistent with regard to definition, measurement, type of event, and time elapsed since the event (Joseph & Linley, 2005; Morrill et al., 2008; Pat-Horenczyk & Brom, 2007; Tedeschi et al., 1998a). Additionally, “studies have also reported inconclusive results or a lack of association with PTG for gender . . . marital status, avoidant-based coping psychological distress and quality of life” (Morrill et al., 2008, p. 949).

For example, Heisel and Flett (2008) found that older adults were more likely to experience positive readjustment in their study on resilience to suicide ideation, while Tang (2006) found that younger adults tended to exhibit more PTG after an earthquake. The type of traumatic experience, the intensity of the event, as well as the physical location could explain some of these contradictions. For instance, the type of culture may influence results, since the above studies were conducted in Canada and Asia, respectively.

The fact that growth and stress could occur simultaneously might be another explanation for inconsistencies in the literature. People often see a traumatic experience as both distressing and as a transition to a new phase in their lives (Morrill et al., 2008).

Furthermore, Morrill et al. (2008) found that PTSD was actually positively correlated with PTG; therefore, current theories suggest that one can experience PTSD and PTG simultaneously (Morrill et al., 2008; Pat-Horenczyk & Brom, 2007).

As mentioned above, PTG has been studied in people who have experienced a wide array of traumatic and stressful events and disasters; however, despite its emerging importance, limited research on the topic has investigated mental health impacts from exposure to wildland-urban interface fires (Marshall et al., 2007). The few research studies that do address PTG and disaster recovery will be discussed next.

### **Resilience and Posttraumatic Growth Following Disasters**

Within the PTG literature, earthquakes were the most commonly researched disaster. Therefore, earthquake research studies are predominantly reported in this section.

A study by Tang (2006) explored psychosocial factors related to psychological adjustment after an earthquake in Southeast Asia. She surveyed 267 adult Thai individuals and found that positive adjustment was most associated with active problem solving and support seeking behaviours. Additionally, “actively seeking support from others was found to weaken the impact of arousal symptoms in order to derive benefits from the disaster” (p. 703). Recommendations included the need for the facilitation and provision of more social support services after a disaster. Tang (2006) also reported that PTG tends to be experienced by individuals who are more educated, and participate in some form of religion.

Karanci and Acarturk (2005) surveyed 200 survivors of the 1999 Marmara earthquake 4 years after the disaster occurred. Half of the sample was disaster volunteers

from a nongovernment organization and the other half of the sample consisted of residents who experienced the earthquake to some extent (although the degree of impact was varied). “The results showed that, using problem solving/optimistic and fatalistic coping, and being a disaster preparedness volunteer are significant predictors of post-traumatic growth” (Karanci & Acarturk, 2005, p. 327).

The final study of note on earthquakes and PTG was conducted with a very large sample of Chinese adolescents ( $n = 3,324$ ) after experiencing the Sichuan Earthquake (Yu et al., 2010). In addition, the researchers measured whether suicide ideation decreased after experiencing the disaster. The findings revealed that the earthquake did result in the development of PTG and also decreased suicide ideation. Factors such as “teachers’ support, contents of media reports, and students’ experience of prior adversities” (Yu et al., 2010, p. 327) were correlated with PTG. Interestingly, Yu et al. (2010) also found a positive correlation between levels of PTSD and PTG.

Gambone (2009), a doctoral student at the university of South Carolina, conducted a qualitative study ( $n = 52$ ) on PTG and participants who had been impacted by hurricane Katrina. Of the 52 individuals Gambone interviewed, 26 participants had experienced the hurricane and 26 participants were evacuated before the hurricane hit. Gambone found, “Participants reported PTG in five main areas of life (existential, personal, relationship, new opportunities, and behavioral)” (p. iv). Further, the findings suggested that there were additional factors of PTG that were significant for disaster survivors that were not present in previous PTG theory; these were increased community closeness, a change in attitude (i.e., “taking things one day at a time”), and an overall sense of gratitude regarding life (Gambone, 2009, p. v). However, it could be argued that

these findings fit under subcategories of the PTGI; more specifically, these subcategories included relating to others and appreciation of life (Tedeschi & Calhoun, 1996; Tedeschi et al., 1998b). For instance, community closeness can be described as becoming closer with others (i.e., relating to others), and a change in attitude and increased gratitude is similar to the appreciation for life subcategory, which includes a change in attitude and priorities (Tedeschi & Calhoun, 1996; Tedeschi et al., 1998b). Gambone reported that the difference between the two groups of participants was that only the individuals who actually experienced the hurricane felt increased sense of gratitude for their life. Lastly, Gambone found that PTG could occur without experiencing physical threat.

Finally, Holgersen, Boe, and Holen (2010) conducted a Norwegian longitudinal study involving 46 participants who survived the March 27, 1980, North Sea oil rig disaster that caused hundreds of casualties. Holgersen et al. measured for symptoms of PTG and PTSD. Participants were surveyed 1, 5, and 27 years after the event. The researchers employed the PTGI (Tedeschi & Calhoun, 1996; Tedeschi et al., 1998b) and a quantitative scale measuring PTSD; however, since the PTGI was recently created, this measurement was only employed on the third wave of data collection (i.e., 27 years after the disaster). Holgersen et al. (2010) found “strong positive associations . . . between PTG and concurrent posttraumatic stress” (p. 413).

However, although there is substantially less information available regarding the psychological effects of wildfires, the above comparison of the available literature to other disaster research is an effort to report preliminary differences between the wildfires and disasters in general. Moreover, since the study reported here focuses specifically on

the psychological effects of wildfires, a comprehensive examination of this literature is important to inform the methods and findings of this study.

### **Psychological Effects of Wildfires**

Since wildfires are a type of disaster, one would assume that wildfire survivors will experience similar psychological, physiological and behavioural reactions, as mentioned above. Therefore, the expression of these symptoms would also presumably be dependent on a multitude of variables such as the environment, personality factors, and coping abilities. However, given that types of psychological effects experienced after disasters remain inconclusive, very little research has addressed the psychological impact of wildfires (Marshall et al., 2007). Moreover, most of the studies on wildfires or bushfires have been conducted in the US and Australia because these areas experience many devastating wildfires that result in mass property destruction, injuries, and death (Bryant & Harvey, 1996; Carroll & Cohn, 2004; Marshall et al., 2007; McFarlane et al., 1997; Russell, Ribbe, Cunningham, Weddle & Langley, 2002). Thus, the findings may not always be generalizable to Canadian residents given the differences in firefighting and disaster policy contexts of these three countries. The findings from the studies conducted in these other countries are discussed to help ensure a comprehensive understanding of the topic is achieved.

One study conducted by Marshall et al. (2007) included 357 participants “who were seeking assistance from adjacent American Red Cross and government relief centers” (p. 509) after the 2003 California firestorm. One of the findings that arose was that people with the most elevated risk of psychopathology were those who had more severe exposure to the wildfire. However, applications of American findings to Canadian

disaster survivors should be made with caution since funding and relief programs vary significantly between countries. For example, the existence of public health and Medicare systems mean that there is a different avenue to provide services for individuals. The accessibility of services could affect a survivor's recovery process a great deal.

Since wildfire occurrences are increasing on a global level, there is a need to investigate the proposed topic (i.e., psychological reactions and coping mechanisms used after a wildfire of both residents and firefighting personnel alike). Moreover, the little research that has been conducted in this area mainly focuses on the experiences of rescue workers during a wildfire and not the community residents themselves (Marshall et al., 2007). More specifically, it is important to investigate the effects of wildfires on rural residents, since research has shown that residents of rural communities experience significantly more mental health barriers than individuals who live in urban areas (DesMeules & Pong, 2006). Since wildfires most commonly involve individuals who live in rural areas, this reality is a concern, as it implies that mental health issues resulting after a wildfire will not be dealt with adequately.

### **Mental Health Barriers for Rural Communities**

There are currently 10 million Canadians or one third of all Canadians who are considered rural residents (Boydell et al., 2006). Globally, rural communities face substantially more barriers accessing mental health care compared to urban residents (Magnussen, Ehiri, & Jolly, 2004). First, rural communities often lack specialized mental health professionals because “geographic and professional isolation make rural communities less attractive to mental health workers” (Boydell et al., 2006, p. 182).

Second, if communities do have mental health professionals, workers often face demands that far exceed their capabilities given the number of clients that need treatment; this commonly results in long waiting lists (Boydell et al., 2006). Third, many rural community members are more economically disadvantaged and, therefore, residents cannot always afford mental health services (Sartore et al., 2008). This is especially problematic when individuals need to commute to the nearest urban centre in order to receive mental health care. The costs associated with travelling to the appointment and taking time off work (which is usually uncompensated) is not feasible for many rural residents (Boydell et al., 2006). Finally, there tends to be a greater stigma around seeking out mental health services in rural areas compared to urban centres (Boydell et al., 2006).

Due to the factors listed above, an Australian study found that mental health disorders among rural residents are frequently left untreated and progress to a more advanced stage (Sartore et al., 2008). Since barriers such as decreased resources and increased stigma around mental health care are common for rural communities throughout the world, it seems reasonable that Canadian rural residents who have mental health disorders will also progress to a more advanced stage if left untreated (Magnussen et al., 2004). For example, Caldwell et al. (as cited in Sartore et al., 2008) stated that young men in nonmetropolitan areas usually do not seek mental health care when needed, and an Australian study by Sartore et al. (2008) reported an elevated rate of suicide among male farmers and farm workers. Moreover, as previously mentioned, a Canadian study found that perceived mental health stigma and lack of anonymity in rural communities are often significant factors that deter individuals from seeking treatment (Boydell et al., 2006). However, researchers also discovered a benefit to knowing

everyone in a rural community—it often results in a close-knit feeling and increased sense of support for community members (Boydell et al., 2006). Finally, lack of awareness of mental health services is also an issue in rural areas; community residents do not know where to go to receive services despite health care professionals' efforts to inform them (Boydell et al., 2006). Since Boydell et al.'s (2006) study also interviewed disaster rescue workers (firefighting personnel), the available research on the psychological effects of disasters for rescue workers was explored and will be reported next.

**Psychological effects of disasters for rescue workers.** Rescue workers have a much greater chance of encountering traumatic events; as such, their risk for adverse psychological effects such as PTSD is also higher than the average person. Rescue workers have been included in this literature review because: (a) they struggle with many of the same psychological issues as firefighters, (b) there has been more research conducted with rescue worker compared to firefighters, and (c) the research has yielded information regarding protective factors for rescue workers that could possibly be applied to the firefighters who fought the West Kelowna fires. Haslam and Mallon (2003) found, “Common disorders related to stress and PTSD in emergency service personnel include: substance abuse, social dysfunction, depression, intrusive memories and sleep problems (Clohessy & Ehlers, 1999; Fullerton, McCarroll, Ursano, & Wright, 1992; Wagner, Heinrichs, & Ehler, 1998)” (p. 278). Further, smaller traumatic events can accumulate over time and lead to the development of PTSD or other psychological disorders that are as severe as symptoms exhibited after one large disaster (Haslam & Mallon, 2003).

Indeed there have been many studies that show disaster workers often develop these negative symptoms (Carlier & Gersons, 1994; Carlier, Lamberts, & Gersons, 1997; Durham, McCammon, & Allison, 1985; Marmar, Weiss, Metzler, Ronfeldt, & Foreman, 1996; Weiss, Marmar, Metzler, & Ronfeldt, 1995), particularly when disasters cause exposure to dead bodies or involve children (Haslam & Mallon, 2003). However, positive psychological benefits and PTG in rescue workers have also been increasingly reported in recent years (Paton, 2005). It is hypothesized that the main determinant regarding whether rescue workers develop negative or positive affects following disasters result from how individuals assimilate change. Paton (2005) characterized the phenomenon as follows:

In emergency populations, “critical” incidents can create psychological disequilibrium. Disequilibrium represents that period when existing schemata have lost their capacity to organize experience in meaningful ways. The event that triggers the disequilibrium thus acts as a catalyst for change. Whether the new equilibrium state that emerges following a traumatic experience is characterized by growth or loss is a function of how hazard experiences interact with the resources and processes activated to confront discordant experiences. (p. 336)

Even though their risk of exposure is high, protective factors for rescue workers include the screening process organizations engage in to ensure employment of resilient employees and the fact that most individuals who are drawn to rescue work have dispositional qualities that are well suited for this type of occupational stress and pressure (Paton, 2005). For example, “extraversion, openness to experience, agreeableness,

conscientiousness, self-efficacy, optimism and hope” (Paton, 2005, p. 337) have all been correlated with positive readjustment following trauma, and these are qualities which many rescue workers tend to possess in higher quantities than the average individual (Paton, 2005). Further, rescue workers have the added opportunity of finding meaning in their work, which has been shown to increase work satisfaction and foster PTG (Paton, 2005). Humour and social support have also been found to offset psychological distress and aid in coping (Haslam & Mallon, 2003). Moreover, rescue workers are able to engage in “communal coping” (Lyons, Mickelson, Sullivan, & Coyne, 1998) as a result of their membership to a cohesive team; this type of coping can sustain or contribute to PTG (Paton, 2005). Finally, rescue workers are trained to contend with these sorts of situations; this not only prepares them for disasters, but also increases their perceptions of competency and self-efficacy, which have also been linked to PTG (Paton, 2005).

**Psychological effects of disaster for firefighters.** Many of the same findings mentioned above are true for firefighters, although research on this population is limited in comparison to research on rescue workers in general (Haslam & Mallon, 2003). One study by Haslam and Mallon (2003) found that the most stressful aspects of firefighting were incidents involving children, especially if they resulted in death. The second most stressful experiences were “incidents that involved gore, dead bodies or where people were in pain” (Haslam & Mallon, 2003, p. 280). Firefighters most commonly engaged in rumination (intrusive, repetitive thoughts about an experience) after a stressful event and worried that something similar might happen to them or their loved ones (Haslam & Mallon, 2003). Insomnia, avoidance, and flashbacks were also frequently reported. Many firefighters relied on partners for emotional support despite the fact that official

brigade counselling services were available. Image preservation was mentioned as the cause for this because firefighters were worried about being perceived as weak or unable to handle their job in such a macho climate (Haslam & Mallon, 2003). Haslam and Mallon (2003) found that although only a small percentage of men met all the criteria for PTSD, several of the men experienced one or more PTSD symptoms. Heinrichs et al. (2005) conducted a longitudinal study and found that approximately 16% of firefighters met the criteria for PTSD after 24 months in the field. The only significant factors that predicted PTSD in this study were higher hostility and lower self-efficacy. Humour and social support were also stated as protective factors from occupational stress (Heninrichs et al., 2005).

It should be noted that no Canadian studies involving mental health issues with wildland firefighters were found even after conducting several searches using various key words. This speaks to the importance of conducting this research, for it is generally unknown whether wildland firefighters experience the same psychological distress symptoms as urban firefighters in Canada. Additionally, no information is available regarding protective factors for wildland firefighters or whether protective factors that have been found for urban firefighters apply to wildland firefighters.

### **Summary**

Disasters such as wildfires are increasing on a global scale (Public Safety Canada, 2009), and in Canada factors such as climate change and insect infestation are making our forestland particularly vulnerable for experiencing large, destructive wildfires (Natural Resources Canada, Canadian Forest Service, 2005). In addition, more people are residing in wildland-urban interface areas than ever before (USDA Forest Service:

Southern Center for Urban Forestry Research & Information, 2004). This poses a significant risk for rural residents in regards to loss of life, injury, property destruction, resource loss, and other social disruptions. Disaster recovery actions and mitigation strategies do not place sufficient emphasis on the short- and long-term psychological factors that impact people's ability to recover from a wildfire (Kulig et al., 2011; Langer, Kelly, Paton, & Vokes, 2007). In part, this is because the topic is poorly understood; there needs to be more research devoted to studying the psychosocial impacts of wildfires (both positive and negative) on rural community members.

The findings from this study can aid in determining methods to lessen individuals' distress as well as discover ways to foster the development of PTG. Helping people heal emotionally after a traumatic event like a disaster or wildfire is important in itself; however, it is also imperative for governments, communities, and individuals to improve disaster recovery and mitigation strategies and for communities to recover and thrive as a whole.

### **Chapter 3: Research Design**

This chapter addresses the design that was employed to conduct this research. An explanation of the framework, sampling, data collection methods, and analysis will all be discussed. A qualitative descriptive framework with overtones of phenomenological and grounded theory was employed (Sandelowski, 2000b). This combination was chosen due to the nature of the research questions, which are descriptive and exploratory and on a topic for which there has been limited research in a Canadian context. Therefore, this study's research purpose was to expose personal perspectives of factors related to individual variation in resiliency. A quantitative method would not be sufficient to gain a comprehensive description of elements linked to people's psychological reactions (Flyvbjerg, 2006). The rationale for the specific type of qualitative design used will be discussed later in this chapter.

This research involved an in-depth study of individual perceptions and experiences of three wildfires around West Kelowna in 2009. Semistructured, in-depth interviews were conducted with West Kelowna residents, community stakeholders, and firefighter personnel who were involved in the West Kelowna fires in order to obtain their personal perspectives about the experience. In addition, clinical scales were employed in order to increase validity of the qualitative results.

#### **2009 West Kelowna Fires**

During the summer of 2009, three fires were ignited that were located around the West Kelowna area and were called the Terrace Mountain Fire, the Rose Valley Fire, and the Glenrosa Fire ("Most Okanagan," 2009; see also Appendix A). These three fires were examined in this study, and their sizes are provided in Table 1. The Terrace

Mountain fire was confirmed to be from man-made causes (Government of British Columbia, Wildfire Management Branch [Wildfire Management Branch], 2009c; “RCMP Says Someone Started,” 2009), the Rose Valley fire was suspected to be human caused, but was never confirmed (Wildfire Management Branch, 2009b), and the Glenrosa fire cause was unknown (Wildfire Management Branch, 2009a)

Table 1

*Fire Names and Sizes for Fires Included in this Study*

Fire Name	Fire Size (Hectares)
Terrace Mountain Fire	9,227
Glenrosa Fire	400
Rose Valley	200

*Note.* Based on information from *Fire Locations 2009* (Government of British Columbia, Ministry of Forests, Lands, and Natural Resources Operations, n.d.).

On Saturday, July 18, 2009, 11,000 residents were given evacuation orders and were forced out of their homes; a total of 22,000 people had to evacuate the area (“B.C. Fire Victims,” 2009). Three homes were destroyed and 10 other homes in the area were robbed during the evacuation period (“B.C. Fire Victims,” 2009; “B.C. Wildfire Forces,” 2009; “Most Okanagan,” 2009). The fires caused considerable anxiety because of their similarities to the 2003 Kelowna Firestorm—more specifically the size of the fires, the number of firefighters needed to extinguish them, their close proximity to residents in the community, and the high financial costs associated with the fires (BC Ministry of FLNRO, 2010). As mentioned earlier in this report, the 2009 fire season (which included several other significant fires) and the 2003 fire season had especially striking similarities in regards to direct fire costs and total area burned. However, the major difference

between these two fire seasons was the loss of property. While the 2003 Kelowna Firestorm destroyed hundreds of homes, only seven homes were lost in total during the 2009 Fire season (BC Ministry of FLNRO, 2010). However, the potential for mass damage comparable to 2003 was evident (BC Ministry of FLNRO, 2010), which was acknowledged by the West Kelowna residents. The study site itself will now be discussed.

### **Study Site – West Kelowna, British Columbia**

West Kelowna is considered its own municipality and was incorporated in 2007 (Westbank & District Chamber of Commerce, n.d.). It is physically situated on the west end of Lake Okanagan opposite from the City of Kelowna (see Appendix A for map of the area) and is a popular area for tourists (Westbank & District Chamber of Commerce, n.d.). Besides tourism, agriculture, forestry, and manufacturing are the main forms of industry (Central Okanagan Economic Development Commission, 2009). The communities within the new district municipality include:

Westbank, which comprises just under half of the total population, Shannon Lake, Glenrosa, Casa Loma, West Kelowna Estates, Rose Valley, and Lakeview Heights. The Westside surrounds two self-governing reserves of the Westbank First Nation: Tsinstikeptum #9 and Tsinstikeptum #10. (Central Okanagan Economic Development Commission, 2009, p. 1)

The most recent census (conducted in 2011) listed West Kelowna's population as 30,892 (Statistics Canada, 2012). According to the Organization of Economic Co-operation and Development definition of rural, West Kelowna is not considered a rural site; specifically, the definition of "rural communities refer to individuals in communities

with less than 150 persons per square kilometre. This includes the individuals living in the countryside, towns and small cities” (Plessis, Beshiri, Bollman, & Clemenson, 2001, p. 6). In this sense, West Kelowna does not meet the rural criteria since in 2011 Statistics Canada reported the municipality density as 250.1 persons per square kilometre (Statistics Canada, 2012).

Plessis et al. (2001) noted that rural could also be defined by geography (i.e., a physical location on a map) or by social definitions (i.e., a way of life or type of culture). During the interviews, the participants were asked to reflect on their perspective of West Kelowna and whether or not it meets rural criteria. All participants considered the area rural due to the mentality and the lifestyle of the individuals who reside there. Participants also stated that they felt it was rural because of the geography of the area, as many residents own large plots of land (specifically in the Glenrosa area), which operate as farms and contain livestock. Therefore, for this study, West Kelowna was considered a rural area. As mentioned in the literature review, rural residents often experience more stigmas in regards to seeking mental health services. This will be discussed in more detail within the “Discussion” section of the thesis. The study framework will now be explained in more detail.

### **Study Framework**

A qualitative exploratory, descriptive design was chosen for this study because it is appropriate for a topic that has been poorly researched. In addition, this type of design is more suitable for the scope and timeframe of this research project, since it is small in scope and was conducted in a short timeframe while meeting the research goals and objectives. Descriptive methods were also fitting in that they require a detailed

description and assign high importance to the perceived meaning that people attach to events; however, they are less interpretive than other qualitative methods such as phenomenological, narrative, or ethnographic methods. In other words, descriptive methods apply a more straightforward analysis; they do not “require a conceptual or otherwise highly abstract rendering of data” (Sandelowski, 2000b, p. 335). This does not mean that the analysis is simplistic or less comprehensive in describing participants’ lived experiences; descriptive analysis simply takes a more face-value approach, interpreting quotations more literally rather than searching for deeper implied meaning (Sandelowski, 2000b).

Moreover, qualitative descriptive studies do not imply the absence of interpretation, as “descriptions always depend on the perceptions, inclinations, sensitivities, and sensibilities of the describer” (Sandelowski, 2000b, p. 335). More specifically, interpretations are made from the researcher’s understanding of the data and the selection of specific themes that are considered most important to report. Finally, since descriptive research is less convoluted than other forms of qualitative methods, researchers’ consensus on the meaning of the qualitative interviews is more easily achieved.

This being said, phenomenological overtones are present, which are simply hues or certain aspects that are generally associated with phenomenological research (Sandelowski, 2000b). Phenomenology’s aim is to study the subjective meanings of people and how they perceive the world (Flick, 2006). Additionally, phenomenology does not evaluate the conclusions or theories as right or wrong, since they are reflections of how the world is viewed by the individual. The research also sought to conduct an in-

depth exploration of participants' lived experiences, which is fitting with the phenomenological paradigm (Flick, 2006). Research along this vein (i.e., previous research on the psychological effects of wildfires) tends to be “descriptive rather than explanatory and . . . [does] not provide a comprehensive account of individual experience” (Joseph & Linley, 2005, p. 262). Further, the psychology discipline is similar to this philosophy, as it relies heavily on personal perspectives; for example, one individual may interpret the same event entirely differently from another individual. As a result, individuals will behave, think, and feel differently concerning the same situation (Burns, 1999). These elements of phenomenological research were incorporated in the analysis of the data; however, since phenomenology is philosophically based and can be overly interpretive for the purposes of this research study, other aspects of this theory were omitted during the analysis. For example, phenomenological methods often require the researcher to consider philosophical concepts such as “corporeality and temporality” (Van Manen, as cited in Sandelowski, 2000b, p. 336) when interpreting participant data. This research focuses more on the literal accounts of research participants, and is not heavily based on abstract interpretation; therefore, phenomenology would not be the appropriate foundation for the analysis. However, due to the reasons listed above, phenomenological overtones were fitting.

Since a literature review has already been conducted on previously existing research, grounded theory—which requires no previous research as theories are developed directly from the collected data—was not entirely suitable for this study (Gall, Gall, & Bork, 2007). However, overtones of grounded theory are appropriate for this research since categories for analysis were created from the data that were generated

directly from the data, which is traditionally done with grounded theory research (Gall et al., 2007). Two additional grounded theory components that were incorporated were: (a) continual reflection on the topic throughout the entire research process, and (b) collecting and analyzing the data in quick succession so that the categories derived closely coincided with the participant data, since the memory of the collection is fresh and accessible (Flick, 2006). However, the latter component was not as strictly adhered to, which will be discussed in greater detail within the limitations section of the thesis. Finally, clinical measures were employed in order to supplement and provide additional evidence for the results and themes identified in the qualitative interviews. More specifically, the clinical tools were incorporated as an attempt to validate the qualitative findings because what was said in the qualitative interview should also be reflected within the clinical results (Sandelowski, 2000a). This combination of tools enhanced the overall description of the findings. Clinical instruments also gave the participants a different medium in which to share information—one that was more concrete and may have appealed to some participants' rather than the open-ended semistructured interview (Yanicki, 2004).

### **Sampling**

Subjects were selected using a purposeful, a priori sample structure, meaning that the sample was predetermined and chosen according to certain criteria (Flick, 2006). The main criterion was the participants' experience with the research topic (i.e., individuals who had direct experience with the West Kelowna wildfires) through firefighting efforts, emergency administrative duties, or being evacuated.

Maximum variation sampling was also proposed before beginning the research project. This type of sampling “allows researchers to explore the common and unique manifestations of a target phenomenon across a broad range of phenomenally and/or demographically varied cases (Sandelowski, as cited in Sandelowski, 2000b, p. 338). Maximum variation sampling is ideal for studies with smaller participant sample sizes that would not be representational of the average population with random sampling. By searching for diverse participants with significant variation, it is hypothesized that the sample will capture the diverse and average elements in a given population to more accurately represent the population as a whole (Patton, 2002). For example, maximum variation sampling states that interviews must include extreme cases on both positive and negative ends of the spectrum. In particular, interviews should be conducted with people who were the most negatively and positively impacted by the fire—in other words those who lost property, and/or were significantly traumatized by the fire versus those who derived positive benefits from it. However, in reality, maximum variation sampling was not achieved, since the researcher was not able to recruit any participants who had lost property or who stated they were significantly traumatized. It could be argued that there were several participants who met the criteria for the positive extreme sought for maximum variation sampling, as several individuals within the study spoke of many more positive themes as compared to negative themes.

In actuality, however, the sampling coincided more with stratified purposeful sampling, which pertains to the act of combining different forms of purposeful sampling methods (Patton, 2002). Since, this study employed a combination of criterion, stratified, and convenience sampling methods, it more accurately fits the stratified purposeful

sampling definition. Stratified purposeful sampling also aims to “illustrate characteristics of particular subgroups of interest [in order to] facilitate comparisons” (Patton, 2002, p. 240). This was achieved in the study by purposefully sampling subgroups of individuals involved in the wildfires (i.e., community stakeholder, firefighters, and community residents). Finally, because minimal property was destroyed in the fires, convenience sampling was important to incorporate due to the unlikely chance of reaching saturation by only interviewing residents who were severely impacted by the fire. Such participants may have been easier to acquire in a larger wildfire such as the 2003 Kelowna fire, as there was significant destruction and property loss, hence individuals may have been more negatively affected by the 2003 fire. However, this research necessitated relying more heavily on convenience sampling, while ensuring access to participants without compromising the quality of the interviews. Generally, individuals who had the capacity to reflect upon and articulate their experiences as well as possess self-awareness in order to comprehend the personal impacts of the wildfire were sought out (Flick, 2006).

### **Recruitment Methods**

In November 2009 the researcher went on a field trip to Barriere, BC, interview some participants for the recently completed rural wildfire study (University of Lethbridge, n.d., Digital Stories section), which provided an opportunity to develop a deeper understanding about rural life while allowing connections with several rural residents. This enabled the researcher to gain a more comprehensive understanding of the values and types of relationships held by rural community members. Although generalizing these experiences to the new study site would be overly simplistic and

stereotypical, it is likely that this previous experience in Barriere provided insight into how to approach and develop rapport with some rural individuals in West Kelowna.

There were two trips made to West Kelowna, for the purposes of both recruitment and interviews. A one-week trip occurred in April 2011 and included recruiting firefighting personnel and community stakeholders—three and two participants from each group, respectively. A second 3-day trip occurred in October 2011 to recruit community residents through a variety of means, which will be discussed later in this section.

The main recruitment technique in April 2011 was to contact community stakeholders such as municipal government professionals as well as firefighting professionals who were living in West Kelowna at the time of the fire. Interviews with community stakeholders—those who hold a professional and/or leadership role within the community (e.g., counsellors and municipal government members)—were arranged through email. Several community organizations were contacted by email (Appendix B) such as the West Kelowna Mayor and Council, and the West Kelowna Recreation and Cultural services. Although it was originally thought that assistance from community stakeholders (i.e., snowball sampling) would be central to recruitment success since these stakeholders could explain and advocate the study to potential participants, this method of obtaining participants was not the primary recruitment method. Due to the Freedom of Information and Privacy Act (2000), these organizations could not provide the researcher with names of individuals who might be willing to participate in the study; however, one municipal government individual agreed to participate and several organizations displayed study posters in their buildings (Appendix C). Further, some organizations

connected the researcher with media material that provided more insight and information regarding who to contact to interview for the study.

During this trip, snowball sampling was used on one occasion: after interviewing a municipal government professional in April 2011, the name and email address of a public leader in firefighting was forwarded to the researcher to contact. This individual agreed to participate and was interviewed during that same trip. The community stakeholders were informed of the nature and purpose of the current study including its overall aim to interview people who experienced the West Kelowna fires.

The remainder of the firefighter participants were recruited from the Municipal Fire Hall. The researcher personally visited the fire hall during the April 2011 trip and directly asked if firefighters working that day would be willing to participate. Two interviews with firefighting participants were conducted that day in a private office within the fire hall.

An individual in Provincial Forestry was also contacted via email previous to the April 2011 trip. Connections with higher-level administration staff within this organization have previously been established by my supervisor through her previous wildfire research; however, only one individual from this organization agreed to participate in this research. To summarize, all of the above individuals were recruited directly before or during the first trip to West Kelowna, which occurred in April 2011. All participants interviewed during this trip were firefighting personnel or community stakeholders.

Due to the fact not all the participants needed were recruited in April, a second trip to West Kelowna occurred in October 2011 to interview the remaining five

community resident participants. Recruitment was done via three different methods: (a) posting study advertisements with posters (Appendix C), (b) posting local ads (Appendices D and E), and (c) connecting with individuals who had participated in April to inquire if they knew anyone that would participate. The researcher's family members that lived in West Kelowna mounted posters in public venues throughout the community.

Between the April 2011 and October 2011 trips to West Kelowna, 10 individuals were interviewed in total at which point data saturation had been reached—participant recruitment ceased when new themes were no longer emerging from the interviews (Gall et al., 2007). The researcher interviewed a variety of individuals within the community for added diversity: three firefighters, two community stakeholders, and three community residents were interviewed, while keeping the diversity goal in mind.

### **Data Collection Methods**

A semi-structured interview, a demographic form (Appendix F), and two clinical tools were employed to obtain the data. The clinical tools consisted of the Posttraumatic Stress Diagnostic scale (Foa, 1995), and the Posttraumatic Growth Inventory (Tedeschi & Calhoun, 1996; Tedeschi et al., 1998b). The researcher developed the semistructured interview and the demographic form. The details of collection and data storage are as follows.

**Qualitative interview.** The qualitative interviews were conducted by using a semistructured interview guide (Appendix G) that was influenced by the clinical instruments and the research literature. The intention of the interview guide was to uncover reasons why individuals reacted negatively and/or more positively in the aftermath of the West Kelowna fire. The semistructured interview has been shown to

make implicit knowledge more explicit (Flick, 2006), which suited the research objective of discovering reasons behind experienced phenomenon. Open-ended questions were asked in order to uncover larger underlying themes (Flick, 2006) as well as reasons for certain perceptions. The interview also included specific questions identifying ways the fire impacted the participant. For example, questions addressed how the wildfire experience affected people's daily activities, plans or goals for the future, views of self, views of the world and their relationships (Tedeschi et al., 1998a); for an example of this, see qualitative interview samples in Appendices H and I. This latter interview format has previously been used in PTG research (Tedeschi et al., 1998a) and has shown to be able to elicit rich, detailed information from participants.

**Demographic form.** The demographic form (Appendix F) included individual characteristics such as date of birth, gender, relationship status, ethnicity, education level, occupational status, and residential history (i.e., length of time participants had lived in the study site). To protect the participants' anonymity, no participant names were recorded; a participant number that was consistent across all forms was used instead. Despite the small sample size, demographics were important to obtain in order to look for links between the demographic data and specific study findings. According to previous research, demographic factors were found to be correlated with psychological adjustment following a disaster (Heisel & Flett, 2008; Korol et al., 1999; Morrill et al., 2008; Tang, 2006). For instance, the findings in this study revealed that males, who were also firefighting personnel, experienced less psychological distress.

The next section will discuss the quantitative measurement tools and how they were used in this research.

**Clinical instruments.** Although quantitative methods were not employed, in addition to developing unique open-ended questions, two quantitative scales— Posttraumatic Stress Diagnostic Scale (PDS) and the Posttraumatic Growth Inventory (PTGI)—were used (Foa, 1995; Tedeschi & Calhoun, 1996; Tedeschi et al., 1998b). The PDS and PTGI instruments had two purposes: they were referenced in order to discern appropriate elements to incorporate into the semistructured interview guide, and participants completed these instruments after the semistructured interview in order to achieve a richer description of the data as well as bolster the validity of the interview findings.

It was important to incorporate some of the themes from the PDS and PTGI instruments because they could assist in answering central tenets of the research questions. In addition, both scales have established reliability and validity in regards to measuring the psychological phenomenon under study, thereby increasing the relevance and appropriateness of the qualitative questions developed (Foa, 1995; Tedeschi & Calhoun, 1996).

The PDS and PTGI instruments were not the central focus, however, because the research incorporated overtones of grounded theory, which aims to uncover new themes and hypotheses. Further, because this research topic has been understudied, it seemed plausible that significant themes in this area had not yet been discovered. This assumption was confirmed and is discussed in more detail in the findings section. However, the two clinical instruments were also useful for validating findings from the qualitative interviews. These clinical tools will now be discussed.

The PTGI (Appendix J) incorporates five subscales that aim to assess the degree of PTG a person experiences (Tedeschi & Calhoun, 1996). These five subscales are: (a) relating to others, (b) new possibilities, (c) personal strength, (d) spiritual change, and (e) appreciation of life. These categories were developed in accordance with the PTG research, which asserts that participants who have acquired PTG will report noticeable improvements in their personal relationships, openness to try new activities, views of themselves, spiritual satisfaction, and views of the world, respectively (Taku, Cann, Calhoun, & Tedeschi, 2008; Tedeschi & Calhoun, 1996; Woodward & Joseph, 2003). The PTGI instrument is currently the most widely used and valid PTG scale available and is also the most empirically researched (Taku et al., 2008). Development of open-ended questions from the PTGI scale helped to explore PTG or, in other words, this scale drew out any positive side effects experienced by the participants from the 2009 wildfire.

The PDS (Appendix K) is a:

49-item, self-report scale to assist clinicians and researchers in diagnosing and judging the severity of Posttraumatic Stress Disorder [in adults] as it is defined in the DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision; American Psychiatric Association, 1994). (Doll, n.d., para. 1)

The PDS is considered a good tool for researching posttraumatic stress symptoms, since it is in accordance with the most widely used diagnostic tool, the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000). Although the purpose of the research was not to diagnose participants in this study, uncovering posttraumatic stress and other psychological symptoms was one aim.

Further, it was important to reveal other themes relating to negative emotions, behaviour, and cognitions after a wildfire (e.g., anxiety, issues in life functioning, negative worldview, and feelings of helplessness). The PDS inventory addresses all of these themes (Foa, 1995) and, therefore, was administered in addition to developing the inventory's central themes into open-ended questions for the qualitative interview.

Of particular importance was to administer the PDS and PTGI after completing the semistructured interview. This was done to avoid interviewer bias; if the two scales had been administered first, their topics would be at the forefront of participants' minds and might, therefore, have been more present within the qualitative portion than they otherwise would be.

### **Data Collection and Storage**

The researcher conducted the interviews in participants' homes or in other settings of the participants' choosing. Discussion about confidentiality and obtaining informed written consent were conducted at the beginning of the interview (Appendix L). In the event that the interviews caused considerable distress, contacts were made available for free counselling and given out to participants after the interview (Appendix M). All individuals agreed to be tape recorded; therefore, short notes were not required (Newman & Robson, 2009). The researcher took field notes throughout the time that the researcher was at the study site (Newman & Robson, 2009). These notes and initial ideas regarding what themes seemed to have emerged during the interviews were recorded after the interviews. The researcher also took note of particular personality traits of participants during the interviews.

The first interview was conducted and then the interview guide was reviewed and revised accordingly. At this point, it was decided to inquire more specifically about the participant's experience with the wildfires in order to elicit more vivid memories and consequently more emotion associated with the event. Subsequent interviews were strengthened by including questions developed from information generated from previous interviews; for instance, if several participants commented on a particular theme, the researcher inquired about this theme in subsequent interviews. One example pertained to the theme of "sense of control," which seemed to emerge in the initial interviews. The participants were questioned in a nonleading manner, but nonetheless they were probed in order to ascertain whether this theme was present for them as well. This is discussed in further detail in the analysis and findings sections of this thesis.

In accordance with grounded theory techniques, once an interview was completed, it was transcribed into a Microsoft Word Document. Unfortunately, due to time restraints, not all of the recordings were transcribed immediately after the interview, which is considered a superior method in which to reflect on the interview and determine initial themes (Newman & Robson, 2009). To protect the identity of those involved, no names are associated with the transcriptions and any identifying information was removed. For organizational and analysis purposes each category of participant was assigned a specific code. For instance, community residents were assigned codes beginning with "R" (R1 through to R5), firefighters were assigned codes beginning with "F" (F1 through to F3), and community stakeholders received codes that began with "A" (A1 and A2.). The transcriptions were filed electronically according to these categories

and were password protected. The demographic forms were kept in a separate drawer at the University of Lethbridge that was secured by lock and key.

The completed PDS and PTGI forms were assigned the same participant code in order to compare and contrast the data within and between cases. The clinical scale data were also locked in a drawer on the University of Lethbridge campus and the results were uploaded into a Microsoft Excel spreadsheet as well as NVivo software (QSR International, 2010), which were both password protected.

### **Analysis**

For the research, successive approximations analysis methods were used, which is a generic qualitative analysis method. Successive approximations analysis methods include creating new theories, but the data were also constantly compared to existing theories in order to determine how well the evidence fit into current literature (Newman & Robson, 2009). This method of analysis develops in stages and evidence and theories shape each other with each review of the data; the researcher found this fitting because themes were created out of the data, which coincided with the exploratory nature of the research questions. In this sense the research has an element of grounded theory; however, because a research question and literature review were completed before the data collection, it was not possible to conduct true grounded theory research (Flick, 2006). Moreover, having a method of analysis that is still rooted in the existing evidence has greater potential for making generalizations from the data.

The transcriptions were uploaded into NVivo (QSR International, 2010), a qualitative computer analysis program that groups paragraphs, sentences and smaller units into specific themes (Gall et al., 2007). As mentioned earlier, a grounded theory

method was used for analysis of the data in that new themes were developed out of the research itself (Gall et al., 2007).

These themes (or categories as they are also referred to) required constant comparison and revisions to ensure that each one was unique and did not overlap with another; however, each theme could be considered “interdependent” since they all aim to answer the research questions (Newman & Robson, 2009, p. 337). Often when themes were too broad they were broken down into subthemes to ensure there were discernible distinctions between them (Gall et al., 2007).

In order to achieve interdependent themes, three stages of coding were conducted: open coding, axial coding, and selective coding (Newman & Robson, 2009). Open coding was the first stage and entailed reading through the data and assigning tentative themes that were later subject to change. During this initial stage it was important to determine which themes had the most quotes, since these were the most pertinent themes in the research. The second stage, axial coding involved reading through the data a second time and attempting to create links between the themes (i.e., organizing the themes in a hierarchy where different levels are created that can be related to correlational sequences). For example, it was apparent that the participants in the study who experienced the highest levels of psychological distress throughout and directly after the wildfire were also able to transform their distress into higher levels of PTG. This finding was considered interactional since it was evident that there was a sequence of events (i.e., one happened before the other). Further, the latter events seemed to have been somewhat dependent upon the occurrence of the former events (Newman & Robson, 2009).

Other types of linking included determining interactional patterns by tracing back to the original locations of the quotes; for example, individuals who spoke of feelings of thrill and excitement during the fire and boredom and monotony after the fire were all firefighting or community stakeholder participants (i.e., all codes beginning with “F” and “A”, respectively). In contrast the majority of community residents (i.e., all codes beginning with “R”) experienced a sense of dread and anxiety during the fire and a feeling of relief after the wildfire. During this second stage of coding it is also important to look for overlapping categories or themes that can be further subdivided.

Finally, the third stage of coding, selective coding, brought everything together; hence the data were analyzed for core themes to which remaining categories fit into (Newman & Robson, 2009). Subsequently, the best interactional and/or correlational linkages were identified in order to narrow down what to describe in the thesis “Findings” and “Discussion” sections (Newman & Robson, 2009).

Throughout this process, analytic memos were compiled, which served to document discussions with the research supervisor or committee members and thoughts that arose throughout the coding process. Notable quotes were also extracted and compiled into a separate memo in order to include in the findings and discussion sections. Newman and Robson (2009) maintained that composing analytic memos is an important part of the qualitative research process, as they “forge a link between the concrete data or raw evidence and more abstract, theoretical thinking” (p. 341).

Throughout this process a second researcher (the thesis supervisor) conducted independent analysis on the data and devised similar themes to those found by the researcher. Independent analysis was completed in order to obtain inter-rater reliability.

The two researchers also agreed that there were no overlapping themes or categories that could be broken down further at the end of this process.

Subsequently, textual descriptions were created. Since qualitative interviews often yield an excessive and sometimes redundant amount of information, only the most pertinent themes were included in the final textual descriptions; however, all perspectives were represented, and the reporting was generally equally inclusive of all participants (Newman & Robson, 2009). There were some participants who were not as valuable in terms of yielding meaningful answers to the research questions. Despite the researcher's best efforts, some of the participants had a tendency to veer off topic and/or not answer the particular questions asked in the semistructured interviews regardless of subsequent probing. Although, these participants were still included, less of their data were appropriate for reporting within the research study.

While it is difficult to generalize findings from a single qualitative study, some of the themes that were uncovered may translate to a larger population of similar disaster survivors. The research sought to discover interactional and relational patterns within the sample and looked for connections that fit with previously established research-based theories. Ideally, a new hypothesis would be created, which could then be tested in subsequent quantitative research studies; however, this is not the overall goal. Moreover, although patterns and links were identified, ultimately the reader is free to develop their own conclusions regarding the generalizability of the findings.

In terms of the clinical instruments, the number of participants was too small to employ quantitative analysis methods. The purpose of the clinical scales was to make between-case comparisons; ideally the findings from the qualitative interviews would

match what was found in the clinical instruments, which was the case in this study. For example, a participant who spoke about how the wildfire influenced his or her development of closer relationships with family members also scored higher on the relating to others subsection within the PTGI. This match was important for increasing the validity of the interview results. These ideas are elaborated on in the next section.

### **Ethical Considerations**

The research was conducted according to the Faculty of Education Human Subjects Research Committee's ethical guidelines at the University of Lethbridge (University of Lethbridge, Faculty of Education, 2011). Therefore, informed consent was obtained by providing the participant with a consent form (Appendix L) as well as discussing the consent form with the participants before conducting the interview. Moreover, the researcher addressed any participant questions or concerns before obtaining the participant's signature consenting to participating in the research. The following topics were discussed within the consent form: information regarding the participant's rights to privacy and confidentiality, the limits to privacy and confidentiality, the risks and benefits of participating in the research, planned uses and storage methods of the data, and various contact numbers. More specifically, the contact number of my research supervisor and the Chair of the Faculty of Education Human Subjects Research Committee at the University of Lethbridge were provided in order for the participant to address any concerns. Further, participants were given contact numbers for free and local counselling services if significant psychological distress arose that they felt they needed professional help for. This was addressed at the time of the informed consent process. Finally, the participants were informed of their option to e-mail or

telephone the researcher should they have any questions regarding the consent process or the research study at a later date.

### **Trustworthiness and Rigour**

The trustworthiness and rigour of the qualitative interviews were cross-referenced by the scores on the clinical scales. This provided added support that the results and themes that emerged in the qualitative interviews were in fact substantiated by two standardized and highly valid quantitative scales (PDS and PTGI). Slight inconsistencies between the qualitative and quantitative measures did arise - these will be discussed within the “Findings” and “Discussion” sections. Steps taken to maintain a high degree of trustworthiness and rigour within the qualitative interviews and data collection process are discussed below.

Subsequent trustworthiness and rigour were established in the research study by maintaining records (i.e., analytic memos) and striving for credibility, transferability, dependability, and confirmability. To establish credibility, negative case analysis was used. Negative case analysis serves to increase credibility by checking for negative instances that oppose any insights or potential theories developed by the researcher throughout the course of data collection and analysis. This was done for the purposes of decreasing the possibility of bias and to consider all perspectives within the literature. Transferability was established through using “thick descriptive data” (Lincoln & Guba, 1986, p. 77)—in other words, the findings portion of the thesis contains a rich detail and descriptions; therefore the reader can choose what they will incorporate into their existing schemas, or apply to their prospective research. Dependability and confirmability were achieved through the use of a secondary, neutral researcher to develop independent

themes out of the data in order to obtain inter-rater reliability. Finally, in order to achieve authenticity, the final write up of the findings represented participants' views, although some were more engaged in the topic and able to share information that was more relevant for the topic under investigation. Therefore, certain themes that emerged that did not align with other findings or emerging theories within the literature could not be omitted simply because they did not fit. The reporting needed to be balanced and honest; this is termed "fairness" within the qualitative literature (Guba & Lincoln, 2005; Lincoln & Guba, 1986). It was also important to give participants a voice by using direct quotations to represent each theme, instead of interpreting and summarizing the meaning for participants (Guba & Lincoln, 2005).

### **Dissemination**

After the analysis has been completed and the thesis is reviewed by the researcher's committee members and deemed appropriate for publication, a variety of dissemination methods will be used, including: (a) binding and preparing this thesis to be available in the university library, (b) posting the findings on the study web page ([ruralwildfire.ca](http://ruralwildfire.ca)), (c) presenting the findings to community agencies and the public in West Kelowna, and (d) reporting summaries to the participating community's local newsletters and newspapers. If possible the following dissemination methods will also be used: (a) presenting at conferences—particularly international, national, and/or provincial scientific conferences; and (b) publishing articles in scholarly journals.

## Chapter 4: Findings

Four main themes emerged after analyzing the qualitative data: (a) perception of control, (b) social support, (c) factors related to posttraumatic growth, and (d) compounding stressors and psychological distress. These themes will be discussed from both positive and negative perspectives as discussed in the interviews. The negative/positive results are further subdivided into temporal categories; that is, negative/positive events reported during the fire, consequences reported directly after the fire, and the long-term effects. Factors that are possibly connected or are antecedent to one another will also be discussed. Finally, findings from the two quantitative inventories—the PDS and the PTGI—will be revealed and will be compared to the qualitative findings. The presentation of findings includes the following pseudonyms to increase the personal nature of the discussion: Allison, Anne, Greg, Haley, Hank, Jeff, Matthew, Michael, Sarah, and Steve (see Appendix N).

Overall, participants reported more positive outcomes from experiencing the wildfires than negative outcomes. Most individuals felt that the firefighting efforts were a success because no one was injured, very little property was destroyed, and the evacuation procedures were organized and implemented in a timely manner. Participants also felt the wildfire outcome was successful because it served to bring the community together. Further, many of the positive effects observed by participants during or directly after the fire appeared to be precursors to developing long-term positive effects.

Alternatively, a few participants mentioned how some negative short-term effects of the fire acted as a catalyst for short-term change, enabling opportunities to transform initial distress into long-term positive growth. For instance, enduring a traumatic event

such as the wildfire gave individuals in this study a chance to reflect upon what they did well and/or if they would have reacted differently in a subsequent wildfire. Most participants stated they “learned a lot” from their experience.

Although the majority of participants mentioned more positive than negative effects as a result of the wildfire, negative themes did emerge; this had an impact in both the short and long term. For instance, most community residents spoke of feeling more anxious over the summer months and had a heightened sense of awareness to possible fire signs such as smoke smell or plane engine sounds. Allison, a community resident, described this phenomenon in the following way: “Smoke smell, definitely, the whole area has been impacted by smoke smell. I don’t know how many false alarms my husband [a local firefighter] goes on because of someone’s barbeque.” Laughing, Allison continued, “People have seen smoke, right?”

Greg a local firefighter who was involved in fighting wildfires in 2009 also noticed how residents’ attitudes on wildfires have changed since that time:

Yeah, it starts getting hot out. Summer comes. Phone calls start ringing: “This is a fire hazard and that’s a fire hazard. Are the evacuation routes in place? Do you have. . . .” People now are aware, we’re in a wildland interface area, and very aware when the temperature hits 35 degrees, and the risk is there, and so it definitely has brought it to the forefront.

The participants acknowledged that they felt ambivalent about this increased vigilance because, while it helped them to become more informed and aware of wildfires, it was stressful nonetheless. This paradoxical perception around fire safety and preparedness was a commonly expressed theme in most resident interviews. Sarah

emphasized this ambivalence and noted how an increased knowledge on disaster preparedness is both empowering and anxiety provoking:

I do feel more empowered because I know more about it now, but you feel vulnerable too, because you realize just how your little world can be shaken up by something you have no control over.

Despite this positive slant to a negative consequence of the disaster, other negative themes existed that were not perceived ambivalently. The analysis revealed that negative consequences were linked with psychological distress, which will be discussed in more detail in a subsequent section of this chapter.

In general, however, the wildfires impacted people more positively than negatively. Moreover, participants reported more positive long-term effects that were consistent with PTG, for both individuals and groups in West Kelowna. For example, the majority of participants felt that the wildfire experience helped them grow as individuals, and/or made them aware of their existing strengths, which was validated in the PTG survey implemented after the interview. Participants reported a sense of empowerment due to these acknowledgments. Most individuals also described feeling a sense of gratitude for the “successful outcome” of the wildfires given the potential for mass destruction. This sense of gratitude appeared to expand to other areas of their lives such as lifestyle, loved ones, and health.

Finally, the majority of participants reported the wildfires helped bring individuals together and maintain or improve relationships. This applied to the community as a whole, families, neighbours, and spousal relationships. These positive outcomes will be discussed in further detail throughout this chapter within the framework

of the four themes mentioned above. The positive outcomes will also be compared to the negative findings within the context of these four themes.

### **Theme #1: Perception of Control**

The analysis revealed that individual well-being was related to the perception of control for the participants in this study. Many participants spoke of feeling either a sense of control or a lack of control over certain elements of the wildfires. A sense of control was antecedent to psychological well-being, and lack of control was linked with more psychological distress. Interestingly, however, a third category, acceptance of lack of control also corresponded to higher degrees of psychological well-being. Participants who spoke of this sub-theme explained their acceptance as an act of letting go and were able to reconcile that they had no control over certain aspects of the disaster. This submission to circumstance, it should be noted, was not consistent with feelings of defeat, or complete lack of control over events. Rather, it was a healthy and rational stance that enabled them to move forward. It was this acceptance that seemed to be related to psychological health and well-being. The following discussion of the sub-themes will further substantiate these findings.

**Sense of control.** Participants related sense of control to several factors: (a) organization, (b) preparedness, (c) successful evacuation, (d) competency, (e) helping others, (f) resuming routine, and (g) looking for signs. Each of these factors will be discussed in turn.

**Organization.** Participants consistently held the view that the community was well organized and handled the disaster efficiently. Residents spoke of how witnessing this organized effort gave them a feeling of safety and the assurance that the wildfires

were being effectively managed, which was evidenced by how quickly the firefighters and community political leaders responded to the crisis. Individuals at the evacuation centre were stated to be organized and capable as well. Haley discussed how the community's ability to handle a disaster was something she was unsure of before the wildfire; however, the wildfire event instilled her with confidence that her community could effectively deal with future crisis:

So that left a new impact for me, in a positive way, and something that I could consider for the future of, you know, what is the community like and how does it respond and what is available for people that are in distress . . . and do they have the facilities that you need and, the responders that you need, and I thought it was pretty great that they did, because I'm sure a lot of communities don't.

***Preparedness.*** A second factor relating to sense of control was preparedness. Individuals who were already prepared for a wildfire, as a result of witnessing to the 2003 Kelowna wildfire, appeared to possess an increased sense of control. After observing the devastation caused by the 2003 Kelowna wildfire, many participants had committed to taking precautions to prepare in the event of a subsequent wildfire in their area. Sarah, a community resident who was evacuated during the 2009 fire, commented on how the 2003 fire had deeply impacted herself and others in the neighbourhood:

May comes around now and they start thinking . . . put all the things that you really, really want to keep, in one area, in one spot, even if it means taking a painting off the wall, you just kind of put it in one spot, ready to go. People put photograph albums in one area, they even put them in their laundry baskets for the summer, ready to go, you know and you sort of go, "Wow!" We've been like that

since I would say 2003, because that is one thing that really impacted on everyone was, “What would you take if you only had fifteen minutes?”

Other examples of disaster preparedness included creating pre-made grab-and-go bags, installing sprinklers systems, and creating an emergency call-out list within the neighbourhood. Allison explained that her neighbourhood had created a neighbourhood emergency call-out list in the event of a wildfire or another emergency; however, the neighbourhood organizers were unable to call down the list due to the speed at which the fire was travelling, which severely limited amount time to evacuate. Further impacts related to insufficient time will be discussed in the lack of control section.

Later in the interview, Sarah told a humorous story related to wildfire preparedness. She explained how she dismissed her husband’s proactive behaviour of installing a sprinkler system on their roof after the 2003 fire:

I kept teasing my husband since 2003 and I said, “We’re never gonna need that,” and then as years went by I went, “Yeah, we’re never gonna need that. You can take that down,” and yet when I went back in [to the house for her pets], one of the phone calls that I got was from him, and he said, “Before you leave turn the sprinklers on the roof on.” So I did.

It appeared that people who had learned from the 2003 wildfire and taken the necessary steps to ensure they had effective mitigation strategies, seemed to feel a larger sense of control during the 2009 wildfires.

***Successful evacuation.*** The fact that the majority of participants viewed the evacuation process as having been successful was another factor relating to control. Most participants reported that they never felt their lives were in danger. Participants also

reported that they, or their loved ones, were able to evacuate safely with most of their valuable possessions, or were able to re-enter later that evening to retrieve them.

Matthew is a firefighter for West Kelowna whose home was also evacuated. He discussed how his wife was able to evacuate everything they needed on her own because they had previously put things aside in the event of a wildfire. However, due to the speed at which the fire was travelling towards West Kelowna and the fact that its ignition point was close to municipal borders, there was very little time to evacuate. This caused several complications, which are discussed in the Lack of Control subsection. Despite these issues, participants as a whole viewed the evacuation as a success.

*Competency.* Amongst the firefighting personnel it seemed a sense of competency and trust was related to control. These participants reported that their sense of competency existed from previous wildfire fighting experience and training, which they stated equipped them to handle the wildfires. Trust seemed to have developed from their previous experience working with each other. As a result, firefighters mentioned or inferred how this gave them a sense of control.

Matthew commented directly about how he felt his training, ability, and trust for his leader and coworkers gave him a greater sense of control. Alternatively, he felt a lack of control regarding his wife's safety, since she was pregnant and he could not be with her to help her evacuate. When asked if he ever felt his life was in danger he stated the following:

No, because I can control kinda what, what's going on with me. I mean, we've trained, and I trust my captains and the guys I'm working with, and I've worked with them enough to know what they're gonna do and that they're competent in,

what they've been asked to do, so I can control kind of what's going on with me.

Like I said, the only thing I worry about would be my wife.

***Helping others.*** During the wildfires, the resident participants reported how helping others gave them a sense of control. Unlike the firefighting personnel and community stakeholders, the residents did not have a specific job to do once they were evacuated. Several residents spoke of how they needed to feel like they were helping and noted feeling a sense of helplessness by simply watching the wildfires burn. Allison was an evacuated resident who also has experience evacuating animals. She talks about feeling the need to do something after she knew her safety and the safety of her family was not at stake:

I needed to be doing something. I mean I think everybody felt that way, that's why you get so many volunteers. When there's a disaster . . . everybody comes out of the woodwork. People need to feel wanted, or busy, or, oh something, and I think I'm no different.

Later in the interview Allison explained how helping others also helped her emotionally; she noted that she felt less emotional when given the opportunity to help because she had less time on her hands and felt good doing something.

After being evacuated, residents engaged in things such as helping evacuate animals, volunteering at the evacuation centre, consoling other residents, and so forth. It seemed that helping others is a precursor to giving individuals a sense of purpose is and connected with *a sense of control*.

***Resuming routines and rituals.*** After the wildfires, gaining a sense of control was achieved in a different manner; participants stated that they decompressed by

resuming their normal, everyday routines and rituals. Greg explained how after the wildfires, re-engaging in the things he enjoyed helped him regain a sense of balance in his life. He spoke of resuming hobbies such as golf to decompress. Greg also discussed how routines such as going to the gym helped him cope with stress and reclaim his balance:

I go for an hour a day [to the gym], doesn't matter, every day if I'm outta town on a trip. I train an hour a day, and that's my biggest stress relief, because it allows me to get rid of all my stuff here [referring to at work], before I go home.

Allison specifically acknowledged how resuming her everyday routines and rituals helped her regain a sense of control:

Yeah, little things like that get the paper in, bring in the paper and read the paper, just little things, make your own coffee, those are big deals! I mean that doesn't sound that big but those were big deals.

To clarify, the interviewer asked, "So, is it that that sense of control that you're getting back?"

Allison responded, "Exactly, that's it! Yeah, you're back in control."

**Looking for signs.** Finally, looking for "signs of hope" was a noteworthy finding and seemed significant to report, despite the fact that Allison was the only participant who mentioned this. Allison explained how she perceived two rare events that occurred during the evacuation process as metaphors for hope. She noted that in the midst of a chaotic evacuation she was able to lasso one "delinquent goat" that refused to load into the trailer. This was significant for her because she had never lassoed anything in her life. Her success in capturing the goat under such circumstances and on her first attempt

seemed like an amazing achievement and a sign of hope. The second sign of hope referred to a shooting star, which Allison discussed in this quote:

It was really neat when—I told you the part about the goat and just realizing that I was probably gonna have to leave her behind, and just before I lassoed her, this huge shooting star went across the sky and . . . I took it as a sign: one, “Okay I’m gonna get the goat,” and secondly, “This could be alright. everybody’s gonna be okay,” because you don’t see a shooting star very often and it was so bright, and it was right there, and nobody else saw it but me! I sort of thought, “Okay, that’s a good sign. We’re gonna get through this and we’re gonna get out of there.”

It seems that in the midst of uncertainty, these signs gave the participant a sense of control that things would work out and encouraged her to press on and maintain a positive attitude. Despite only one participant in this study talking about signs of hope, this was an intriguing finding that needs further research to determine whether it occurs among other residents who have to cope with a wildfire. Although the category, sense of control, was common in the interviews, the second subcategory, *lack of control*, was also noted and will now be discussed in depth.

**Lack of control.** As previously noted, individuals who reported that they felt out of control during the disaster seemed to experience more psychological distress; therefore, in accordance with the literature on perception of control, lack of control appeared to be a precursor for negative psychological outcomes (Lazarus & Folkman, 1984; Prince-Embury, 1992). This section focuses on five main factors that are linked to lack of control: (a) unknowingness, (b) one exit, (c) no time, (d) acknowledgment of luck, and (e) dispositional qualities.

*Unknowingness.* A recurring theme of “not knowing” (i.e., not knowing if your house burnt down, not knowing where your loved ones were, etc.) seemed to be linked with participants feeling a lack of control. Barriere and La Ronge residents also discussed this fear of the unknown (Kulig et al., 2011). These individuals stated how not knowing was a huge source of stress and anxiety. This finding was consistent in this research as well. Mainly participants experienced this distress when they had to wait several days to discover if their house had burned down. Matthew discussed this topic in the following statement, which refers to a time after he and his wife had evacuated and gone to stay with his sister-in-law:

So there was that little bit of, when we got there at 3:00 or 3:30 or whatever it was, we could see the fire burning, so there was a little bit of that unknowing if maybe our house had got it or not, and, like I say, we had everything we needed, and it was what it was, but still, it still woulda’ sucked. It’s still not something you wanna deal with.

The stresses of not knowing were compounded due to the existence of conflicting reports regarding how many homes had burned down. Since Matthew is also a firefighter, he explained how he felt a large sense of responsibility for protecting community residents’ homes. Not knowing or having inaccurate information about property losses the first evening placed a great deal of stress on Matthew:

I felt the night of the fire was probably the hardest because I thought we lost a bunch of houses; because initially they were reporting that we lost a ton of houses. Initially, that’s the stuff we were hearing, but that’s all just word of mouth and hearsay.

Residents also experienced this lack of information or unknowingness during the evacuation process. Participants described simply following others and not knowing what would occur next. For instance, residents stated that they had to line up down one main neighbourhood road to evacuate, which became bottlenecked due to the mass amount of residents leaving simultaneously with their livestock in tow. Once participants evacuated, they were directed to the evacuation centre and had to line up for several hours to receive vouchers for clothes and toiletries. Haley discussed how the evacuation process led her to feel somewhat helpless.

They kind of usher you along, “Okay, if you’re back here this is what you need to do,” and “go here,” . . . so it was more of an immediate process. “What shall we do next?” We’d gotten everything outta the house, so . . . what do you do? You can’t control that, so there’s that too. It’s like we can’t control it, so there is quite a feeling of being vulnerable.

Some residents also experienced periods when they were unsure of the whereabouts of their friends and loved ones, which was described by participants as a feeling of helplessness. Michael is a municipal administrator and participated as community stakeholder in this study. Michael explained the worry he felt when he was unsure of the whereabouts of his wife and son. Due to the fact that the neighbourhood had already been evacuated, residents were prohibited re-entry; at that point his wife and son decided to hike back in through a back route in order to rescue their family pets that were still in their respective houses. In the following vignette, Michael explained his fear around not knowing where his wife and son were, or whether they were safe:

My son lives down the street from us. . . . So they're [wife and son] doing all this I don't know where they are. I left them there, to go in [bottom of neighbourhood], and I don't know what's happening. . . . Of course, whenever this sort of stuff happens, cell service and phone service . . . [is] jammed [because it] is really rocky. You know you can't reach them, so that's sort of the first point, you don't know.

Overall, most participants felt that the evacuation process was organized; for example, there was a registration area at the evacuation centre that people could use to locate their family members. If family members had not registered, then people did not know the whereabouts of their family members for an extended period of time.

***One exit.*** The fact that Glenrosa only has one main exit (aside from a second long service road, which was in poor condition), was (and still is) an immense concern for Glenrosa residents. Having only one exit was found to be related to lack of control. Participants expressed fear over the realization that they could have been trapped had the main road been inaccessible due to the fire. Haley spoke about this issue in the following vignette:

The other issue there is with being in Glenrosa . . . there's only one way in and one way out. . . . That was scary, and it really makes you think, "Okay, what's the plan, if that happens [and the road gets blocked off]?"

This worry continues for the people who still reside in Glenrosa; the participants in this study stated that the community acknowledges that this was a large issue during the evacuation process; however, they stated that nothing has been done to address this issue. In general, participants believed that it is the responsibility of the municipality of

West Kelowna to address because they are in charge of disaster planning. Participants stated that they experience ongoing anxiety about the possibility of future wildfires and the dangers they may face if their main escaped route is blocked due to fire. This appeared to be a major issue that was related to a sense of lack of control for these participants during the wildfires as well as presently.

*No time.* Due to the fact that the Glenrosa fire began on the outskirts of the municipality, all resident participants stated having very little time to prepare for evacuation. Greg explained this issue further:

The type of fire we had was . . . a fire that started and it just went straight into the town; where most forest fires start outside and then you're setting up for how you're gonna prepare if it does come into town. But we didn't have that. We had no preparation time.

Participants spoke of how people became trapped outside of their neighbourhoods due to the immediate evacuation order that ensued. Michael described this best in the following statement:

The Glenrosa thing was that the fire started so close in such intense wind, there was basically zero time. I mean, the home up on [name of street] that was lost was lost within the first half hour. You know what I mean? No chance, you know, the people weren't home.

Individuals could not return to their homes to retrieve their possessions or animals. Allison spoke of how helpless and guilty she felt when she realized she could not go back in to evacuate her animals until later that evening:

You look around your home that you've lived in and there were irreplaceable paintings—well not valuable, but to me it is, and photos and I ended up taking I think two paintings. . . . I had four dogs in the car. I had about twelve cats on the farm—it's a farm right—and livestock, and no trailer, so I was really hanging on hoping that I wouldn't have to leave until I had a trailer. . . . The hardest part for me was, I didn't want to leave the animals behind. And I had a plan in place again—people to come get my animals with a trailer—but of course, we didn't have time.

Fortunately, once the fire was well contained, an animal rescue team was allowed back in and successfully evacuated all of the animals.

*Acknowledgement of luck.* Others realized how vulnerable they were when they reflected on the luck that was involved in making the wildfire outcome successful (in their perception). For instance, several participants stated that the wind had shifted at the last minute, which in turn directed the fires path away from the neighbourhood. Michael discussed this in the following vignette:

I mean the worst nightmare—and it was going this way, at one point I mean you think about the implications of going across Glenrosa and Glenrosa, I think it was 7000 people, something like that . . . you coulda had 1,000 homes, if that had gone in there, so we were lucky that way with the wind.

Participants acknowledged that they had no control over the wildfire's trajectory or the wind direction and expressed fear over the realization that their community could have been incinerated if it were not for the last-minute shift in the wind.

*Dispositional qualities.* A final factor linked to *lack of control* pertains to individuals' dispositional qualities. Disposition or the personality traits of participants in this study seems antecedent to the ability to cope more effectively with the disaster. It was observed in this study that the individual traits of anxiousness and/or sentimentality as well as a higher need for control were precursors to difficulty coping and adjusting to the disaster. In a humorous exchange, Anne described herself as being a nervous person and how it impacted her ability to remain calm during the wildfire. She rhetorically confirmed this with her husband, Hank.

Well, I guess just a bit of fear, you know, like the panic, but then I am a bit of a nervous person. I mean, I do tend to overreact about certain things. I worry, I'm a worrier. Am I a worrier dear?

Hank scoffed, "Yeah, right."

Anne replied, laughing, "Yeah, I do tend to worry."

Along the same vein, Jeff, another participant who held a leadership role when fighting the wildfires stated that he was in "a bad place after the fire." When probed about what this meant, Jeff admitted to having high expectations for himself, which he stated was a precursor to the anxiety he felt during and after the wildfires. He related his anxiety in the following explanation:

Because I, wanna do a good job, when I go to work I wanna do good work, you know? I wanna supervise my crews well so that they're efficient and happy, and I want to make sure my supervisor's happy with my work, and how I deal with other people so, . . . I think when you're—when you have that . . . I don't know if

perfectionist is the right term, but . . . I want to do a good job, and I want to succeed.

Participants who possessed these dispositional qualities in the study talked more about feeling a *lack of control* as well as experiencing more negative psychological effects from the wildfires.

Sarah spoke of how her daughter-in-law was a “nervous person.” Sarah stated that her daughter-in-law literally had to “drive through the fire.” Sarah perceived that the wildfire experience had negatively impacted her daughter-in-law over the long term and explained this in the following vignette:

[My daughter-in-law] quit her job, and I think this is how it affected her. She quit her job because she was having to go into Kelowna all the time and she went into a home business . . . so she could be home for her daughter, and just be home because she was so uptight, you know? Just so anxious, nervous, and now she’s relaxed.

The interviewer asked, “Is she more uptight because of the fire you mean?”

Sarah responded, “She was like high anxiety, and I think after the fire, yeah, it kind of scared her, and she realized what was important.”

It appeared that in this study individuals who were prone to experiencing more anxiety had a larger need for control; therefore, they became more distressed when they perceived themselves to be lacking that control.

Allison also discussed how her tendency to internalize worry and stress impacted her physically:

My stomach—starting with the fires from 2003—it would hurt so badly, so badly, and of course it came back even worse in 2009, and . . . it's still not right, I mean I'm delaying going back to the doctor because . . . I know they want to do a scope to see what's happening with my stomach, and I keep thinking, "No, no it's stress. I'm dealing with it." . . . and I think that's still there.

Here it is unclear as to whether anxiety was an issue for Allison before experiencing the 2003 wildfires. All that is clear is that her worry was connected to long-term negative effects. Later in the interview Allison explained how her tendency to worry more was also linked to feeling less secure in her surroundings. In other words, she appeared to feel less in control of her safety since experiencing the disaster, which seemed to be connected to increased worry. In response to a question pertaining to long-term negative effects that Allison has experience as a result of the fire, she responded by saying: "I probably worry more. I don't take things for granted as much. I think that often we think were safe from anything where we live, you know?"

Sentimentality and a heightened sense of empathy were personality traits that also appeared be linked to lack of control for some participants in this study. Allison discussed sentimentality in the form of her connection to her material possessions. She explained how she had an internal battle with herself regarding their importance. More specifically, she acknowledged how they were "just things" and that they were not as important as she believed they were; however, on the other hand, she spoke of how these things represented a person who is special to her (some of whom have passed away). Therefore, when she evacuated and had to leave many of these things behind, Allison seemed to experience more emotional distress at this apparent lack of control regarding

the fate of her possessions. Allison also made several comments about the effects of the wildfires on others during the interview that highlighted her heightened sense of empathy. Anne also appeared to possess both traits of sentimentality and increased empathy for others.

Anne provided the following, which exemplifies this connection. She compared herself directly to her husband who lacks sentimentality regarding material things. When asked what she was thinking as she drove away from her home during the evacuation Anne stated:

I'm thinking, we might not come back to a home, that doesn't bother him [referring her husband, Hank], you know he's not one for pictures and things in the home. He's never been like that, but I got really, really upset, and then we got to the bottom of [name of street] . . . [and] the people were coming down Glenrosa and they were bringing their horses and stuff, and that's what really got to me too, you know, I'm thinking, "These people got families, and their animals."

Subsequently, Anne explained how she becomes frustrated when things do not go as planned and noted how she could remember being that way from a young age. Within the literature, one study by Tang (2006) referred to this trait as neuroticism, which was reported to be correlated to more negative psychological adjustment following disaster. Anne also expressed her need to be in control (i.e., to plan and organize).

Anne stated, "I'm a real, real planner, real planner."

The interviewer asked, "So, what if, if things don't go as planned then?"

Anne responded, “It gets very frustrating for me . . . but I’ve always been, always, even as a child, organized, my room was just organized.”

Both Hank and Anne agreed that Anne was more emotionally impacted by the wildfire. In contrast, her husband, Hank, felt very little distress from the experience. He also described himself as much more relaxed, easy-going, and adaptable when things did not go as planned. Hank functioned more as a problem solver in their marriage. Perhaps this is another factor connected to his lower level of distress; by solving a problem, Hank is able to feel a sense of control over the situation. Problem solving was reported to be associated with positive adjustment following disaster in one study discussed in the literature review (Tang, 2006). Further exploration of this topic occurs in the Discussion portion of this thesis. Hank cleverly used a simile to explain how he and his wife perceive things differently:

I think you [Anne] tends to go, “Oh the world is falling,” . . . you know, “The sky is falling right now,” and I’m thinking, “Well, just a minute, let’s see, is it actually falling or is it just tilting a little bit?”

Anne agreed with Hank’s statement, and Hank continued on to state, “And I’ll maybe take a little bit longer to kinda make a judgment of the situation.”

Participant dispositional qualities such as Hank’s that included flexibility, adaptability, and resourcefulness were linked to being less negatively impacted by the wildfire. Participants with these traits also served in more emergency-type roles. One indicator of why they may have coped more effectively is that they seemed to be able to identify and accept circumstances where they had no control and yet take charge of the

situation when they could affect change. The third component to the control theme relates to this topic, accepting lack of control, which will now be discussed.

**Accepting lack of control.** This category is divided into two noteworthy subcategories: preacceptance, those who accepted a lack of control at the time of the wildfires, and post-acceptance, those who initially lacked this trait, but gained it after reflecting on the wildfire experience. These two subcategories will be discussed, respectively.

*Pre-acceptance.* The participants who seemed to be able to accept their lack of control over aspects of the wildfire event were males and/or firefighters but the significance of this finding is limited by the small sample size. Therefore, more research needs to be done with a larger sample size in order to ascertain more information about this connection. Nonetheless, in this study, these two demographic features were linked to possessing a higher propensity to accept a lack of control. Perhaps, it is because individuals in these types of roles frequently contend with crisis situations in their occupations—situations that have several uncontrollable elements.

Moreover, most firefighters explained how their previous firefighting experience helped them discern what they could control and what they could not. This ability to differentiate seemed to help them overcome certain stressful situations and avoid self-blame. Despite acknowledging that the wildfire outcome was mainly positive, Greg also discussed the importance of playing out a more negative scenario. Greg explained why this was important for him. His attitude appears to be related to many years of experience working as a firefighter:

On the other avenue I was looking at it personally and say, what if it went the other way? You know, and things went really bad, in that sort of incident. How would our department have been perceived and how would the whole story line change so, you know you realize that in hindsight that sometimes it doesn't matter how good you are in fighting fires, because over my career—it's been 35 years now—that some fires go good and some go bad no matter what. If good decisions are made, sometimes mother nature, wind, things can change to make things very difficult to deal with, so on my end I look at myself as I was, just as much lucky as good.

In this sense it seemed to be a healthy attitude to adopt in order for Greg avoid future self-blame. Reflecting on what it could have been like if the outcome was not a positive one helped him accept that sometimes he is not entirely in control of the outcome. Greg thought this was important so he could prepare for future wildfires that may not have such a positive outcome.

I'm probably gonna do this another four or five years, and I may have to deal with a negative one [wildfire] one day. Hopefully not, but in the case it does, I wanna make sure that I'm prepared for that too.

Although the majority of these individuals were firefighters, one male community resident, Hank, possessed this attitude as well. Interestingly, he was a retired police officer and stated that he had accumulated years of experience dealing with traumatic events, ones that he stated were much more traumatic than the 2009 wildfire. In addition, Hank asserted that he personally experienced a second natural disaster in 2010 that was also larger and more devastating than the wildfires. In contrast to his wife, he was more

able to accept when he lacked control as well as feel a greater sense of control over the experience.

You know it was unsettling, more for you, [Anne], because you're leaving your home, but as I say, you've got some control, you can move away, but an earthquake you can't get away from. I thought, you know like the one in Christ Church in New Zealand? We've been there.

Instead of dwelling on what he could not control (i.e., his house burning or the fact that he could have been trapped from only having one exit), Hank looked at what he could control. Subsequently, Hank compared the disaster to one that he considered having even less control over, which appeared to be a positive way to reframe the situation.

*Post-acceptance.* The second area refers to participants who felt distressed due to factors that were out of their control during the wildfires, but who were able to learn from their experience and adjust their attitude accordingly. After reflecting on the fire experience, some participants were able to rectify within themselves things that they could not control and come to accept this. These participants stated this change was a positive outcome of the wildfires. However, this did not occur without undergoing some initial distress or seeking support. For example, during the wildfires Jeff spoke of wanting to do everything correctly and feeling over-responsible for the wildfire outcome (i.e., he felt like doing a good job meant saving all property from the fires destruction, when in reality, he could not have controlled the fact that some property burned). Jeff explained how his high standards for himself contributed to a feeling of helplessness.

I want to do a good job and I want to succeed, so at times when . . . maybe the only good job you can do is just sort of, watch, while . . . you know, while bad things happen . . . if the situation is beyond, abilities of what you have, then sometimes that can be a—you feel helpless.

After talking to a health professional Jeff was able to acknowledge things that he did not have control over and was able learn coping skills and adopt a healthier attitude around this. As a result, Jeff states how he can generally cope with life and job stress more effectively now:

But I guess from that [2009 wildfire experience and counselling], I've learned that you can only do what you can do, sometimes, nothing's going to stop a fire. So, during that time you just have to have confidence in your ability to recognize that and be satisfied with keeping yourself and your resources safe, so that nobody's going to get hurt, and sometimes that's the only winnable objective.

Ironically, Jeff explained how this made him feel more empowered as he felt more equipped to effectively deal with general work and life stressors. Jeff elaborated upon this in the following vignette:

I really feel like having gone through that now [2009 wildfires and counselling], I'm able to just process that more, so I can feel stress and anxiety, but then I can let it go and move on and still be . . . a healthy person and not go through like weight gain, massive stress, relationship, like implosion almost and then get it sorted out.

Interestingly, Jeff is younger than Greg (a firefighter who was more adept at accepting what he could not control), has less experience fighting fires, and was new to

this particular role at the time of the 2009 wildfires. These factors may be linked with Jeff's ability to ascertain what is controllable in a fire. Jeff discussed this topic himself and noted that accepting lack of control and dealing with the resulting stressors is important for his future career:

As I continue in my career, I'm going to be taking on more and more responsibility so . . . as I move up and I guess as I learn and get more experience with stress and anxiety with myself . . . those levels I think won't ever drop. . . . Because as you move up you're taking on more and more, so you're sort of biting off more and more, and with that comes more stress and anxiety, but I feel confident that I've learned how to manage that, so that instils. It feels pretty empowering actually, and I feel—it just gives me a lot of self-confidence, and I really noticed that in other things I do. . . . Because I've gone through these things, I'm way more equipped to do a lot of other stuff . . . so, that in itself makes me feel really good. . . . It makes me feel like, I've won.

Jeff seemed to understand that he could not control stressful aspects of fighting fires and that, as his seniority increases and he is promoted to roles with more responsibility, the stakes will always be higher. However, Jeff knows that he can control how he deals with the anxiety and is, therefore, able to accept these uncontrollable elements. These skills seem to be helpful in other areas of his life as well.

**Summary of theme #1 – perception of control.** To summarize, the theme of Perception of Control was discussed within this section. Higher levels of psychological health appeared to be related to a greater sense of control during the wildfire for participants in this study. Participants linked this greater sense of control to factors such

as preparedness, successful evacuation, and helping others. In contrast, individuals who felt a lack of control throughout the disaster tended to experience more psychological distress, which was related to issues such as having insufficient information, no time to evacuate, and specific personality traits such as increased sentimentality and the tendency to worry. Moreover, initial distress was sometimes linked to the development of PTG. Finally, the factors corresponding with accepting lack of control were discussed as well as possible explanations as to why accepting lack of control was beneficial to psychological health. The next theme, support, explores the various types of support that acted as precursors to psychological well-being for the participants in this study.

### **Theme #2: Social Support**

Consistent with the disaster literature, most participants listed support as a large component to their positive outlook on the wildfire outcome (Haslam & Mallon, 2003; Morrill et al., 2008; Paton, 2005; Tang, 2006). An overwhelming majority of participants expressed their appreciation for people's help and cooperation during the wildfires. Among those who helped were volunteers (within and outside the community), neighbours, government agencies, local businesses (i.e., Walmart and Zellers), and external agencies (i.e., Red Cross). Several participants commented how the outpour of support they received served to create a heightened sense of community within West Kelowna. Moreover, support was viewed as a large contributor to individual resilience during the fire. It was also seen as an indicator of PTG. Participants mentioned that further support came from friends, coworkers, family, and spouses. These next subsections will discuss types of support participants stated they received in the following

order: neighbourhood and volunteer support, business support, coworker support, government support, family support, spousal support, and friend support.

**Neighbourhood and volunteer support.** Community resident participants reported how community members and neighbours were very supportive during the wildfires. Allison discussed several ways she witnessed her neighbours helping others. Below, Allison provided one particular example of this neighbourhood support, which occurred during the evacuation process:

The neighbourhood is wonderful. You know there was one fellow who kept coming by on his ATV, and he'd go to everybody's house and just say, "Okay, we gotta get out of here! Here's the phone number of someone you can call if you have to stay somewhere." You know, "Here's my mom's address." So people were really wonderful that way.

Allison also made another statement, which is worth noting because of the deep impact it had on her.

People who are just doing things like making sure that the houses are secure or going in and bringing you a pizza to eat because you've been on duty for you know, for X amount of hours. You know, a lot of people stepped up and did a lot of good stuff.

Allison paused for a moment as she became teary and then continued,

Excuse me, I'm usually not emotional about these things. . . . Yeah, people would come through. I mean people bringing things, blankets, you know, and things for people, and then also the animals. I can't believe the store of food that we were donated for animals.

Although Allison did not state the roles of the following individuals (i.e., external agency volunteers, or community volunteers, etc.) in the previous quote, she later noted that she felt disasters brought out the best in people and the worst in people. The majority of community residents echoed Allison's sentiments regarding how helpful their fellow community members were during this difficult time. Haley noted that this sense of community was new to her. Moreover, she stated that it lasted long after the disaster was over; therefore, it seemed to be an indicator of PTG in that the charitable behaviour of people within the community at the time of the disaster brought people closer together.

Haley stated:

The interesting thing that I noticed what that from that [wildfire experience], [is] a sense of community, which had never been there in the whole 22 years we lived there, . . . and it was following that. I can recall after that going for walks in the area, which I'd done, you know, every day for years—going for walks after that and the neighbours would actually say hi if they were out . . . which they hadn't done before. Yeah, I found it very interesting.

However, not everyone perceived the increased sense of community to be a long-term change. Matthew expressed how he noticed people slowly returning back to their old ways of behaving in the following quote:

I mean, I think it's the same thing. I mean you see it, you saw it in '03 as well. Everybody gets all lovey-dovey for six months and everything's great, and we help our friends and help our neighbours, and then they come back to just status quo.

Matthew explained status quo as a way of functioning where people still experienced normal frustrations with local law enforcement and returned to an old way of being (i.e., “urban attitude” that is discussed below). Greg noted that despite West Kelowna’s recent growth and the adoption of a more urban attitude (i.e., people keep to themselves more and not everyone knows one another), the community seemed to revert back to a “rural attitude” during the wildfire. Greg explained a rural attitude as a heightened sense of community, whereby neighbours helped one another out more, as compared to in a city. Greg discussed how this mentality and cooperation were pointed to as precursors to the wildfire fighting successes in the following vignette:

You know you get these towns that are kinda growing to larger scales, like to city or municipality . . . but when an incident happens, everyone comes back to the small town thinking . . . or help their neighbour, or help other people: “Where can we help people get put up?”, or people coming forward, “I’ve got free time, can we help out with people that have been evacuated?” . . . So that’s the part that’s kinda neat is that it does bring a town—like large cities, it probably doesn’t effect—but when we get places like Kelowna and here [West Kelowna], it still brings it from that city back to that small town level of helping other people.

**Business support.** Most participants in the study also mentioned support provided by local businesses. For instance, Haley and her family happened to have a mobile trailer that they lived in while they were evacuated from their home. In the following quote, Haley spoke of the gratitude she felt after her and her family received support from a local business.

So we were very fortunate, and I noticed a few other people too they ended up allowing us to go to Wal-Mart to park. . . . We had people coming to the parking lot, and they brought coffee and donuts just for everybody that were evacuated. Participants also mentioned Zellers as a local business that opened its parking lot to evacuees. The majority of community residents stated how they felt these businesses (e.g., Walmart and Zellers) were there to support the community in a time of crisis.

**Co-worker support.** Another firefighter participant, Matthew, spoke of the internal support among crew members, which resulted because of trust that had developed from years of working together in life-threatening situations.

I mean it's guys you work with all the time, right? So yeah, you gotta trust the guys you work with, and . . . that's kinda what a big chunk of this job is because you can't do everything yourself. . . . You gotta put the faith in the other guys that they're gonna do what they're supposed to do and, for that part mostly, you saw the results, and I have a lot of faith in our chief too.

Steve, another firefighter during the time of the West Kelowna wildfires, stated how his leaders' support made a huge difference for him, without which he would not have been as successful at doing his job:

I would have been totally lost, without the . . . support from the people, our captains and our firefighters that got bumped up to fill captains' roles and lieutenants and captains.

Lyons, Mickelson, Sullivan, and Coyne (1998) termed this camaraderie and support among crew members as "communal coping" (p. 579). Researchers explained that this type of support occurred with rescue workers who were part of a cohesive team

(Lyons et al., 1998; Paton, 2005) and is defined as “a cooperative problem-solving process salient in coping with both individual and collective stressors” (Lyons et al., 1998, p. 579). Paton’s (2005) study also linked communal coping to maintaining or enhancing PTG, which will be discussed more in the Findings section.

**Government support.** Participants found larger government agencies and other firefighting crews to be very helpful during the fire. Michael talked about their large contribution to the firefighting efforts. In the following quote Michael discussed how, in his opinion, the fire departments did an exemplary job during the 2009 wildfires:

The evacuation side is well thought through, and the EOC [Emergency Operations Centre] is a marvellous thing in this area, where we all work regionally, and we—for our fire we had Lake Country, Peachland, all the other fire departments here to support us.

Support from Unified Command was also noted during the interviews. Greg gave specific examples such as how working under this umbrella created a supportive atmosphere for making decisions regarding firefighting strategies. Greg explained how this cooperative process helped him feel less alone in terms of making major decisions that would impact the whole community. Greg appreciated that it was truly a concerted effort and expressed how well everyone collaborated to fight against the wildfires. Teamwork and collaboration were common sentiments that the majority of participants expressed in several forms throughout the findings of this research.

**Family support.** Another large source of support came from participants’ family members. Matthew spoke of how helpful it was for him to have his in-laws to stay with after he and his wife were evacuated. Since he was out fighting the fire, he was

exhausted when he came back to the community, and he noted how helpful it was to have the little things like meals taken care of for him.

Matthew and other participants stated how family support served to bring people closer together and as a result families spent more quality time together, which appeared to be a permanent change. This implies the occurrence of PTG in the form of *relating to others* (which will be discussed later in more depth). Matthew proceeded to elaborate upon how this incident improved his relationship with his in-laws:

You know, and even with my family and stuff, I think it definitely, it improved our relationship with my in-laws and stuff like that. . . . You know, you spend that much time with them. . . . I mean, we were there for five or six days solid, other than when I was working, so yeah, it was good, I mean, it was . . . I guess you could say a bonding experience with your family, and we get away a lot more together now and do some camping and that sort of stuff.

**Spousal support.** Along the same lines, participants who were interviewed for this study noted how their spouses were instrumental in both physically helping them to evacuate as well as acting as a support to aid in coping with the emotional impact of the wildfires. It seemed that participants in this study who felt the most supported by their spouses had a strong relational foundation that had been previously created by experiencing difficulties in the past. These past struggles seemed to instil trust within them that they could depend on one another in difficult times. Anne spoke about this ebb and flow in the following quote:

I think we try to be positive, and if he [Hank] gets down, you know like he'll say, "Oh, I feel kind of depressed," and then I'll try to be up, and then I'll be down,

and then he's—you know he's okay, so we try to, you know, we really try to balance each other out.

Later in the interview Hank related this spousal support to the wildfire and questioned how the single friends they know fared emotionally without that same support:

See a single person, we gotta a friend there down the hill who got evacuated too. She's down there by herself, and I wonder how much that affected her. Because she was, you know, she's doesn't have the support, I guess, of her husband.

Matthew and Allison also mentioned how spousal support was an important factor to help them cope with the wildfire experience. They also stated how the wildfire experience served to enhance the confidence they previously had in their spouse and stated that their spouses were impressed with their ability to contend with the wildfires in whatever capacity they were involved in (i.e., firefighting, helping evacuate animals, etc.).

**Friend support.** Finally, support offered by friends had an important impact for study participants. Allison discussed this and mentioned how it was helpful to debrief with a friend who was also contending with a wildfire in her area; Allison's story of support is shared again in a later section. Anne and Hank also mentioned friendship as an important source of support for them. In particular, they explained how knowing their friends were there to support them in their time of need (i.e., the evacuation) gave them the added confidence that their friends were people they could count on. In this sense, it appears that Hank and Anne were alluding to PTG that occurred for them by improving their relationships with their friends. Anne stated:

You know, you assume that before that friends are going to be there to help you, but after it happens, then you know for sure. Sometimes you think, and then if you phone, and then, “Oh no, I’m sorry you can’t come, I’m busy,” you know, but yeah, it’s—they’re there.

**Summary of theme #2 – support.** In summary, support was listed by all participants as a large factor linked to decreasing distress and increasing resiliency. As mentioned in the literature review, during a disaster, the perception of support (particularly government support) was commonly found to be a large factor mediating psychological distress (Mellon et al., 2009). Participants also indicated that other forms of support such as friend, family, spousal, community, and local business support were important for coping with the negative impact of the disaster. Additionally, in this study, support seemed to function as a precursor to the development of PTG; previous researchers have also reported these findings (Lyons et al., 1998; Paton, 2005). The next section, Factors Related to Posttraumatic Growth, discusses how elements such as support and other factors were antecedent to the development of PTG.

### **Theme #3: Factors Related to Posttraumatic Growth**

Every participant in this study mentioned experiencing more positive than negative outcomes from the wildfires. This was validated with the survey instruments, in which individuals scored significantly in several areas of the PTGI or at least experienced sub-clinical growth in most areas. Moreover, no one met the criteria for PTSD. In fact, most participants’ symptoms scores were very low or non-existent for the PDS. There was only one PDS score that was even close to significant. Hypotheses as to why this was the case will be discussed further in the Discussion section of this thesis.

Nonetheless, the PTGI and PDS instruments validated the results from the open-ended interviews; more precisely, at the time of the interviews, individuals stated that they experienced more benefit than trauma from the disaster.

Due to the fact that participants mentioned a larger numbers of positive than negative topics, it was important to look specifically at what participants identified as positive themes and/or ways of coping as well as identify areas of PTG that may be linked to these components. Many of these positive factors have already been identified in previous sections of this thesis. For example, the fact that participants felt that addressing the fire was a success, the large degree of support participants experienced during and after the fire, their gratitude about the overall fire outcome, and so forth. Further, in the Perception of Control section, individuals also discussed ways they regained a sense of control by resuming everyday routines and rituals. This is a form of self-care, which is also a positive factor that has already been described. Therefore, in order to avoid redundancy, I have merely identified the positive themes that I have previously gone into depth about earlier in this chapter.

However, there are additional areas that individuals identified as positive that have not been discussed thus far. I will discuss these factors in more detail in this section. These topics include debriefing, self-care, humour, and reflection.

Further, I will discuss the areas of PTG that participants reported most frequently in both the open-ended interviews and the PTGI. More specifically, of the five areas of PTG (spiritual change, relating to others, personal strength, openness to new possibilities, and appreciation), the most predominant growth for individuals in this study occurred in the areas of relating to others, appreciation of life, personal strength, and new

possibilities. Finally, I will posit possible links between the antecedent positive factors and the areas of PTG.

**Debriefing.** The majority of participants stated that they talked to someone or several people about the wildfires directly after the disaster occurred; whether it was simply to share what had happened or to formally debrief, this type of behaviour was regarded as a positive way to cope after the wildfires. Allison explained that, for her, debriefing occurred in a more casual manner with friends, family, or even neighbours. Steve also commented on how informal debriefing done with colleagues in the “bush” (i.e., while out physically fighting the wildfires) helped him relieve some stress:

You know we would split up once in a while and then meet up, “How’s it going?” “Oh, this person’s being a pain in the ass, and this happened, and this person got bee stings,” and all that stuff, but it’s really good to have that camaraderie when you’re out in the field.

Allison discussed how she engaged in some additional formal debriefing by writing articles for a newsletter. She stated this was helpful for her to emotionally process the wildfire experience. Participants debriefing methods appeared to be linked to PTG, in that they helped people reflect on the experience and consider how they might do things differently, and hence open them up for new possibilities. For example, Allison told a story about how talking with a friend who was going through a wildfire herself helped them both consider what they had learned from their experiences. This conversation also aided Allison and her friend in determining what they might do differently in the future:

Yeah, it was right shortly after that I got home that my best friend got evacuated in [name of area], so she was going through it, and she was trying to find a place to go, so I ended up taking her critters actually, down at my place, and that gave me a chance to help her decompress and have her [say], “Okay, this is what I did, and this is what worked and didn’t work.” . . . So that was good for me too, and afterwards when it was all over, we both talked about it, “Okay, what could we have done differently?”

Therefore, Allison appeared to become more open to positive change due to the fact that she was attempting to learn from her experience. Debriefing also served to foster communication with others, which relates to the PTG category of relating to others. For the most part, debriefing served to bring people closer together.

However, there is a downside to excessive debriefing, which Sarah described as “emotional whiplash.” She discussed how, although she appreciated how many friends and family from out of town called to see if her family was okay, she also described it as tiring and as causing her “emotional ups and downs.” It seems that this had more to do with the fact that it was not necessarily Sarah’s choice to debrief in this sense, and she was also dealing with emotional family members who were asking Sarah what had happened. Therefore, by repeatedly telling her story, she was essentially reliving the wildfire experience multiple times. Perhaps this is an important distinction when debriefing after a disaster—debriefing should be in moderation and at the discretion of the individual affected. The next section pertains to self-care, which is the second positive manner in which individuals stated they coped positively with the fire.

**Self-care.** Participants engaged in several forms of self-care behaviour in this study, which appeared to be connected with various areas of PTG. As previously mentioned in the perception of control section, individuals reclaimed their sense of control after the wildfire with self-care strategies such as re-engaging in routine household chores and daily rituals like making coffee and reading the paper. Similar to this form of self-care, participants also described just “taking it easy” after the wildfires and letting themselves decompress and relax. In the following vignette, Sarah described how she felt after the wildfires and what she did to relax afterwards:

Sarah said, “I think you just felt emotionally drained. It takes you awhile to get back.”

The interviewer asked, “Yeah, what did you do to recoup for yourself?”

Sarah laughed and shared, “I read good books. I stayed home.”

The interviewer responded, “That’s good, and that was helpful for ya?”

Sarah responded, “Yeah, I relaxed.”

Allison engaged in similar behaviours in order to unwind after the fire experience. She stated that she even took a few days off work to give herself the time she needed. When the interviewer asked what she did, she replied with: “I just stayed home, and that was my way of decompressing and sort of, getting back in the swing of . . . daily chores, daily life.” Allison also mentioned doing activities that she enjoyed such as going for hikes, enjoying the outdoors, and working with kids.

Although short-lived, Steve had the opportunity for a brief reprieve in the middle of his firefighting efforts. He explained how this form of self-care was very helpful to him. Once the Glenrosa fire was contained, Steve was able to take a small break before

going out to fight the subsequent fire that had ignited on Terrace Mountain just 2 days later.

Steve stated, “It’s around the same point, that little recharge, that little day, day and a half break was perfect.”

The interviewer replied, “That made a big difference for you eh?”

Steve said, “Yeah, totally did.”

Greg talked about the importance of self-care for him after the wildfires. He explained how responsibilities for firefighters are ongoing even after the fires have been contained. These responsibilities include dealing with the aftermath of the fire’s destruction within the community in various forms that will be discussed in the fourth theme in this chapter, Compounding Factors Leading to Distress. After these responsibilities subsided, Greg was able to take some time off and went away on vacation as his form of self-care:

Well for myself I didn’t have any holidays because they all got cancelled because of the, the deal [wildfire] but later in the summer I took a couple weeks and it was nice just to get away from the fire end of things for a couple weeks. You need to because it’s just, it kinda becomes your whole life.

It appears that Greg needed an emotional and mental break after being inundated with wildfire issues for several weeks.

These forms of self-care all appeared to give the participants time to reflect on the wildfire experience and engage in things that they enjoyed in life. Therefore, these self-care behaviours may have been precursors to PTG areas such as appreciation for life.

Areas where individuals experienced PTG will be discussed in a subsequent section. However, the third positive behaviour related to PTG that was mentioned by participants will be discussed next.

**Reflection.** It appeared that reflecting on the fire experience was common among most participants and was strongly connected to the PTG area of appreciation for life. Often participants' appreciation for life were expressed in ways such as acknowledging how thankful they were for the life they have, and some participants indicated changing their perspectives on what is important. Sarah discussed this change in attitude in the subsequent quote:

You know I think, for the neighbourhoods that were so directly affected and seeing that Terrace Mountain fire coming towards our fire [Glenrosa] we realized just how fortunate we are. I think there are people that are in a lot better moods. They're not cranky and crabby and complaining so much. They're more like, "We were so lucky." I have a much better perspective on things now. . . . We have so much to be thankful for, rather than all the things that we're missing, and were they really that important?

Moreover, Sarah perceived this change in attitude as long term and she believed this new perspective was particularly salient for community members because "we keep getting reminders every summer." Sarah continued, "I mean, there's a fire every [year]." The long-term growth that she is implying is likely an indicator of PTG (in the form of appreciation for life and relating to others).

A second way people re-evaluated their priorities was when they were faced with the possibility of losing their home and, therefore, all of their material possessions.

Individuals explained how they reflected upon the importance of their material possessions and came to the conclusion that they were not as valuable to them as they originally thought.

Sarah expressed this sentiment by stating, “You’re suddenly aware that you know what everything you have, stuff, is it really that important?”

The interviewer responded, “Mm hm, you have to prioritize eh?”

Sarah said, “Yeah, maybe we have too much stuff, and the best thing to do is get yourself out and be healthy.”

Allison also mentioned how she reflected on whether her material possessions were as important to her as she initially perceived them to be before the wildfire. As mentioned in an earlier section, Allison qualified that her possessions were important to her because they symbolized memories and loved ones who had passed on; however, she also acknowledged that they were just things:

We put values on the other things because they come—you know they’re part of our past, and for that reason they’re important, but we can live without them. I mean, they’re irreplaceable, but they’re always in here [points to her heart].

Reflecting about what individuals could have lost also appeared to place a greater importance on their relationships. Most participants mentioned how this reinforced that the people in their lives were much more important and that material possessions were always replaceable. More discussion on this topic occurs in the section entitled PTG areas within this chapter.

In addition to acknowledging that material possessions were not as important to her, Haley discussed how the fire influenced her to feel an appreciation on a larger scale.

In other words, Haley's overall appreciation for life was enhanced as a result of the wildfire experience:

Just more of an appreciation I think, because we were very fortunate. It could have been, pretty catastrophic for a lot of people, but it wasn't, you know, so much for the neighbourhood, so yeah, I just think more appreciation overall for the fact that it did happen, and we were all very fortunate to be able to go back to our homes, except for the odd couple that were burned. . . . Yes, so just a broader perspective on what is really important, "Oh, I don't need to take that with me." You know, if it were to happen again, "let's just go," so I have less of an attachment, I think, to it than I would have at one time.

Allison expressed how she also reprioritized what was important in her life.

Despite admitting that she tends to worry more overall as a result of the wildfire experience, she also qualified that her worry is now reserved for larger issues. In contrast she stated that she is able to let go of smaller problems in life.

Yeah, if anything I don't sweat the small things as much, right? I seem to have more patience with people I work with, and things that would have bothered me before, little things, I'm not as anxious about now. Yeah, I think the small stuff, I'm not gonna worry about as much, or I don't feel I worry about it as much.

The fact that Allison also mentioned increased compassion for others is an indicator for PTG within the relating to others subsection. This area of PTG is defined as gaining closer more rewarding relationships as well as developing increased compassion for others.

On a different note, Steve looked at the experience with a sense of awe and excitement. He reflected upon how successful the wildfire fighting efforts were and felt proud of the way he and his coworkers handled the disaster. Steve discussed how he spoke to other coworker about his perspective on the wildfire:

That was the best ten hours of my whole career! I probably won't be able to top it. Like, no one got hurt. We burned down like three houses. We coulda' burnt down like dozens. I wouldn't say we'd burn down thousands of houses. We protected the mill. We protected the sewage treatment plant. . . . No fire fighters were hurt, no pilots were hurt, no wildland firefighters were hurt, no contractors, nothing. . . . It was really cool, [and] it was really dangerous, but from a learning point of view, there was so much going on that you get to process after.

Not only did Steve's reflection appear to be related to PTG areas such as personal strength, in the sense that he realized the inner strength that he possessed, but it also may have influenced openness to new possibilities. Since he discussed reflecting upon what he had learned, it seems plausible that he would be open to doing things differently in the future.

Gauging by the multitude of quotes in this section, it is evident that many participants engaged in various forms of reflection in this study. Reflecting appeared to encompass a wide variety of thoughts (learning, gratitude, re-evaluating priorities), which were linked to several forms of PTG. The following section will discuss humour, the fourth positive factor linked with PTG.

**Humour.** In accordance with disaster literature, which asserts that humour is a positive coping mechanism for disaster workers (Haslam & Mallon, 2003) and

firefighters (Heinrichs et al., 2005), alike, Steve discussed using humour to cope during the wildfire: “What was really cool is that I could joke with [names of colleagues], so . . . you can joke with the guys.” Since he was in a leadership role he felt more comfortable joking with colleagues in a similar role to him; however, he noted that he uses humour when he interacts with individuals he supervises as well to deal with general work stressors. Perhaps, when things seem bleak, humour serves to change people’s perceptions regarding an event. Hank and Anne alluded to this in their interview and expressed how they use humour a lot to cope with life’s ups and downs. They appeared to harmlessly tease each other throughout the interview and had a comfortable banter that seemed as if it developed from years of marriage. In the following quote Hank discussed the importance of his laptop. He stated that he learned to be more prepared from the 2009 wildfire and his laptop would be the main thing he would ensure he took during an evacuation. When asked why the laptop, he explained it is the only material possession he really values.

Anne responded with the following joke: “Yeah, the laptop first, then it would be me.”

Hank responded, “But if you were carrying the laptop . . .”

Anne laughed, “Oh, there you go.”

Hank said, “—that would be your safest route out.”

When probed further about their friendly banter and whether they used humour to cope in life, Anne replied, laughing:

As you get older, trust me you’ve gotta have humour. You gotta laugh at things.

. . . We’ve gone through quite a bit, in the last couple of years. We’ve had some

deaths, and you know, you have to just sort of get on with it, and your kids don't ever go away. They come home, and you think they're down there [out of the country], and "Coming home!" – "Oh goody!"

Humour seemed to align this couple because it enabled them to share a moment and be on the same wavelength with each other; therefore, humour may be linked to PTG in that it improves how people relate to each other. Humour often serves to make a dark situation lighter, such as coping with the deaths that Anne and Hank mentioned. In this sense it may lead to increased appreciation of life because it may allow participants to gain a new, healthier perspective on a negative situation.

In the following paragraphs I will specifically elaborate on what participants' state have been positive changes in their lives as a consequence of the 2009 wildfires. For all intents and purposes, these positive changes can be construed as PTG, the majority of which are reflected in the PTGI as well.

**PTG areas.** The subcategories of PTG that were mentioned most frequently by the participants included: relating to others, appreciation of life, and personal strength. (Although PTG in the new possibilities area also seemed to occur, it did so to a lesser degree than the other three areas and has already been discussed in the section above.)

***Appreciation of life.*** As previously discussed, participants stated that their appreciation of life was enhanced in several significant ways after the wildfires. Most often, individuals expressed this change in the form of not taking things for granted. Several participants also stated that they became less upset if life did not go as planned or in the direction they intended (i.e., "don't sweat the small stuff" mentality). In her interview, Haley described how the wildfires encouraged her to reflect on how she spends

her time and energy. Haley determined that previous to experiencing the wildfires she would often engage in activities or completed favours simply to please someone else and not because she actually wanted to do it. Haley explained how she still puts emphasis on helping others; however, she is now more likely to put a greater priority on her own needs as well. She also explained how she is more cautious about spending her energy on something negative or non-fruitful (i.e., reassessing what is truly important in life).

Therefore, in addition to enhancing Haley's appreciation of life (since she re-evaluated her priorities and world beliefs), it seems the wildfire experience also served to increase her personal strength (because she appears to value herself and her own time more than before). Finally, it may have also functioned to help Haley be open to possibility (since she is more likely to make changes in her life than before she may have endured). The next section pertains to the PTG area of relating to others.

***Relating to others.*** It was clear from the support section that participants believe many of their relationships were improved as a result of experiencing the wildfires.

Sarah explained how she felt it has brought her and her family closer together: "I think I've really learned to appreciate that it's families that is so important, and just life itself is just really important."

The interviewer responded, "Yes. Does that influence any ways that you live now?"

Sarah clarified, "I celebrate my family more. I get together with them more, and friends."

The interviewer asked, "Yeah, so it's brought you guys closer?"

Sarah responded, laughing, “Yeah, it’s amazing how you think alike, and you realize you think alike when you get a phone call, ‘Where are ya?’ So yeah.”

Matthew could not be there to help his wife evacuate, and he explained how his relationship with his wife had improved after acknowledging that she evacuated on her own: “My confidence in my wife and stuff is better, you know. I know she can take care of what needs to be taken care of.”

Allison, who is married to a firefighter, also commented on how the wildfire experience helped them become closer and increased their confidence in each other.

When asked about how the wildfires impacted her relationships she responded:

I think it’s made them better. I think my husband and I, you know we were really able to get things done as a team. I know he admired me for taking charge when he wasn’t there and getting everything out of the house and the farm by myself, because he didn’t expect that. He said when he came home and there were no animals, he couldn’t believe that. So he really was impressed with that, and of course, I was really impressed with his bravery, doing what he was doing. I saw a side of him that I’d never—I knew he did fire practices and stuff, but I’d never seen him have to deal with a huge blaze like that, so it brought us even closer, to go through that together and we both were able to, to do it. We stepped up and got it done.

Increased compassion for others was another way Allison described PTG in the relating to others area:

I think there’s a lot more empathy for what other people struggle with now, and if you think of—when I hear of fires, in Australia, you know my heart goes out to

them, because . . . I feel for them even though I can't be there doing anything for them. Stuff like that it's made me a little more compassionate for the way others have to live and what they have to do.

In addition to improved personal relationships and increased compassion for others, participants in this study stated they grew personally as a result of experiencing the wildfires. Personal strength is the third factor of PTG within the PTGI (Tedeschi & Calhoun, 1996; Tedeschi et al., 1998b); it is also the third and final category of this section, and will now be discussed.

***Personal strength.*** Personal strength is the final area of PTG that individuals reported experiencing as a consequence of the wildfire. Hank put this best when he reasoned: "Well, I guess I think anything that you go through that's not normal is gonna make you a little stronger." In this study, individuals reported growing both professionally and personally. A large section of this was discussed in the accepting lack of control section, where participants like Jeff and Allison acknowledged that the wildfire helped teach them that they could not always control things in life. Michael, who held a leadership role in West Kelowna and did so at the time of the 2009 wildfires, discussed how the experience also influenced his professional growth:

I grew personally, as a [type of professional role] and as a person. I grew personally because I was [name of leadership role], and the things I had to do, that I never thought I could do. You know, getting up in front of the national media and the international media, and handling it all pretty well, and getting credit for it.

Here Michael inferred that his personal and professional growth were intertwined and mutually influenced by the wildfires. Allison also mentioned how she felt that she learned the true meaning of perseverance after enduring the evacuation process. Allison was responsible for evacuating all the animals and pets on her farm, and she did so successfully. When asked about any lessons learned, Allison replied, “The lessons I guess of perseverance. You know, never giving up. Never saying that it can’t be done, because in most cases you can get it done.”

*Summary of PTG areas.* In summary, participants stated many different factors that were beneficial to them during and after the wildfires—debriefing, self-care, reflecting on the disaster, and the use of humour. These behaviours also appeared to be connected with PTG. Relating to others, appreciation of life, and personal strength were the main areas of PTG that was observed to have occurred among participants. In addition, new possibilities was a fourth subcategory of PTG that occurred for some participants. However, despite so many positive accounts and instances of positive growth from experiencing the wildfires, participants also listed ways it caused them distress. Therefore, the fourth and final theme in this research examines the factors that were linked to psychological distress that was experienced during the wildfires.

#### **Theme #4: Compounding Stressors and Psychological Distress**

The types of psychological distress that is discussed in this section all have one common characteristic—they were additional stressors that compounded with the stress of the wildfires. Some stressors were related, such as the fallout from the wildfires that occurred afterwards. In other words, the “disruption of usual individual and collective functioning itself becomes part of the disaster” (Stacey, as cited in Brenner, Bush, &

Moses, 2010, p. 3). In this study these stressors included financial and political issues related to the wildfires, and physical clean up of the area. Alternatively, other stressors were of a more personal nature; they were unrelated to the wildfires, but happened to be occurring simultaneously. For the most part, once the additional stressors subsided, most of the psychological distress did as well. Fortunately, participants generally did not imply that their short-term distress functioned as an antecedent to long-term psychological dysfunction. Each stressor will now be discussed in turn. The first stressor examined is dual roles.

**Dual roles.** Most of the firefighter and community stakeholder participants explained that much of their distress was as a result of the dual roles they held during the wildfires. These dual roles included public relation and/or media figure versus professional as well as family versus work roles. Steve, who experienced both types of dual roles, made this comparison: “You’re like a piece of bubble gum, and everybody’s pulling from different directions.”

***Public relation and/or media figure versus professional.*** Steve explained the difficulty with the competing roles of professional firefighter versus media liaison because the people who expected him to fulfill a particular role had no knowledge about the expectations or timelines required for the other role. For instance, Steve explained a schedule where he was expected to report to a particular location to brief his firefighters for the day, yet on his way there media approached him in order to obtain information about the wildfires. Since he held a leadership role at the time of the wildfires, he felt an obligation to talk to the media. Steve expressed frustration about the added political

expectations as well: “We always have to think about the political stuff, and it’s like, just let us do our job. We’ll deal with that kind of stuff next week, kind of thing.”

Michael also mentioned how he felt torn between his professional role within the municipality and the pressure to respond to the media:

I had to do a number of media things like that, even in the evening, and I was told there was, you know, “You’re gonna be on at ten. [The name of a news station] is here.” . . . You have a role, as a [name of job title], to indicate that we are on it. We do have systems in place; they’re not perfect but we’ve got fire departments, we’re working with the province, we have evacuation centres, and to insure people that, you know, there is a government in place that’s dealing with it.

Michael recalled how much stress he felt during this time since he was new to his particular job position and was somewhat unsure of his abilities. In contrast, Greg stated he had several years of experience in his particular firefighting position; however, he had never dealt with such a high profile wildfire event. As a result, he also felt overwhelmed due to his unfamiliarity with speaking to the media who were not local.

At times it was overwhelming, but the amount of – that people wanted you, you know, . . . that’s the biggest part when you’re in the fire service that you’ll find when you’re in the top is that . . . news group, the media, how they need your info and they want you there. And you’re still running things and still trying to do things, so you’re kinda juggling. . . . So that to me was the high stressor for the whole thing. Not the fire, but all the other stuff that went with it.

Greg explained how it was different from anything media related he had to deal with before, since his previous experience was all with local media:

Well I don't think anyone goes through that demand . . . here [with] a local little house fire, here one reporter comes up from the news, you know them all, and then here I had people from Australia, Boston, we had even people from the BBC and different places, all converging and phoning and wanting interviews, and . . . that's probably the most overwhelming part that I found.

Greg explained how he was also very conscious about the way he portrayed himself, the firefighters underneath him, and his firefighting organization. He felt an obligation to represent his organization well. Greg explained he was especially vigilant about negating undue blame from his organization when discussing any negative aspect of their firefighting efforts. In other words, as Greg put it, "You have to be very careful not to hurt your organization."

This particular dual role dilemma applied when dealing with community members as well. Both Greg and Jeff talked about being repeatedly approached by multiple individuals within the community who wanted to talk about the wildfires. Although Greg and Jeff understood the importance of talking to the public about the fires, given their particular status as a leader, it also became draining. At times they said that they felt like they needed a mental break from wildfire-related topics. Jeff expressed this in the following vignette:

I just wanted to remove myself from that whole West Kelowna area . . . because it was – you know, with stuff like that . . . if you stop and get gas at a gas station, people just want to talk and ask questions, which I have no problem with, but when you're stressed out, you're just—I get tired of that. It's like everyone wants

to talk to you, and you just want to go where people weren't affected by it, they weren't seeing it every day, . . . yeah, just had to get away.

Greg echoed Jeff's sentiments about the difficulty of holding an identifiable role during the wildfires. He discussed this in the following way:

Everyone wants to talk to you, and of course . . . small community, you wanna be nice to the people that you work for, but then after a while you wanna let go of the fire and . . . move on to your regular things, so it took quite a while for that to happen.

***Family life versus work life.*** The dichotomy of responsibilities to one's family and responsibilities to one's organization was the second type of dual role discussed by participants in this study. Often, the two roles were incompatible, forcing individuals to choose one or the other. Even when people had no choice but to fulfill their work obligations, they still experienced guilt over neglecting their family role. Jeff expressed how his wife is enrolled in school abroad and so was away for most of 2009. Jeff explained how trying this was for their relationship since his wife only returned to Canada from April to September, which was the same time that the fire season began; therefore, Jeff was not able to spend much time with her, particularly during the summer of 2009:

We talk about that period of time as being a really difficult time for the both of use, because we'd been married for . . . not even a year I guess.

Steve also jokingly noted that his wife might be "a fun person to talk to." He explained how work and family life were not compatible and what it was like for him and his wife during the wildfires. He mainly attributed it to lack of communication and

miscommunication. At times his wife had no knowledge about his whereabouts or whether he was safe. He discussed how he felt so stressed he forgot that he had not given her any information:

I came home and I thought I told her everything that was going on and she was completely stressed and I was like, in a different [mindset]—like I'd been dealing with stressed out people for ten hours and she's freaking out, she's just like another person like, what's the big deal? I just wanna go to bed.

Allison provided the last example of this type of dual role. However, her position was reversed since she is the wife of a firefighter. Allison talked about how this experience was for her in the following quote:

That was an interesting kind of thing because as a fire fighter [my husband] feels duty bound, right? If he gets called, he goes because he says, “[Name of participant], if I can get there first, I may be able to stop that, and our house won't be lost,” but I say, “Well if you leave the house and I can't get home, and everything burns, I lose all the animals, how do I ever forgive you for that? Because you have a choice.” And he says, “Well, I don't really have a choice because I have got to be part of this, band of brothers, and that's what we do,” and I understand that, right.

Allison noted how she understood this reality but also felt torn because at the same time she felt like she needed her husband home helping her with the evacuation. She explained how this affected him:

I put him in a bad situation because yeah, he felt. You know he could make a difference with the fire, but he knew that he was also potentially sacrificing our

own home, right, and we'd seen that happen during the Kelowna fires. So that's a tough call.

Fortunately after the wildfires of 2009 Allison and her husband were able to sit down and figure out a plan that they could both agree on in the event of another wildfire. Therefore, in this sense, this initial distress served to improve their communication and, hence, their relationship.

As mentioned in an earlier section, Matthew also stated how he felt torn between home and work life due to the fact that he had a wife who was eight months pregnant. Fortunately, knowing that his wife would most likely be responsible for the evacuation of their home in the event of a wildfire, Matthew and his wife had come to a prearranged agreement and prepared accordingly (i.e., prepacking their valuables in bins that she could carry on her own). Therefore, both parties knew and accepted that Matthew's first priority was fulfilling his duties as a firefighter. Matthew worked several hours on the wildfires and was able to return to be with his wife once the Glenrosa fire was largely contained.

*Summary of dual roles.* In sum, experience of these dual roles was particularly salient for participants, as it was mentioned by every community stakeholder and firefighter interviewed in this study. Fortunately, this type of compounding stress was only an issue during the wildfires themselves. The next topic will discuss some ongoing factors that were linked to distress.

**Ongoing responsibilities.** Participants explained how they faced ongoing responsibilities (i.e., the aftermath of the wildfire disaster was stressful). Ongoing

responsibilities also compounded with the initial stress from the wildfires themselves.

Greg explained this well in the following statement:

There's a lot more than just the incident. . . . I think most people in the profession find the incident is the easy part. It's all the aftereffects, and the fallout after is, you know, how much is it gonna cost now, and how much is this going to be, you know, why were all those resources put here? . . . All those questions come back to you after the fact, and so those are dealings that carry on for a while.

Participants in leadership positions were more affected by these stressors than lower ranking firefighters or administrators; however, the latter type of participant was also affected by these ongoing responsibilities, as they too had to contend with these issues in some capacity.

The fact that West Kelowna was newly incorporated posed additional problems. Michael discussed how the wildfire impacted the entire community, in terms of how it affected the economy of such a new municipality. Michael also explained that these ongoing financial and political responsibilities were stressful for him and his coworkers.

It's the fire costs. It's all the other costs of running the EOC [Emergency Operations Centre]. . . . So that was our second year of incorporation, as a new municipality, and the first year was kind of a nothing year because we were staffing up, but this put a huge dent in us financially at the time, and administration wise, and you know it took us off track, where we needed to go and had planned to go, for months.

From a forestry perspective, Jeff talked about the stresses of coordinating rehabilitation after the fire and how this stress is different from fighting the wildfire itself,

but is stressful and tiring, nonetheless. With no break between fighting the wildfires and launching into rehabilitation mode, Jeff explained how emotionally draining he felt as a result of the ongoing responsibilities of the wildfires.

Once the fire was done and we were doing rehab, I mean it's not—it's more sort of stress with organizing everything because there was . . . God there was like . . . a couple hundred kilometres of fireguard that had to be rehabbed. I'm pretty sure, yeah it was like—it was an incredible amount. So it wasn't like stress from a personal safety or the safety of others, or property point of view, it was stress from getting this huge job done.

Finally, the last topic discusses miscellaneous stresses. These are mainly of a personal nature and the majority were not directly related to the wildfire event.

**Other additional stressors.** During the wildfire, several participants were contending with other significant stressors in their life that did not get put on hold simply because a disaster occurred. Moreover, a stressor for one family was made particularly worse as a result of the wildfire. Haley spoke about this issue in the following quote:

Yeah so there was a lot of fear, I think, for the future of if, if you didn't have a house to go back to what are we gonna do? Because we were in the process of selling our house. We'd just, like in the summer listed it so, we thought, "Oh no! What are we gonna do?"

Fortunately, their house was not burned in the wildfire. However, Haley discussed how the additional stress of selling their home did not give them a chance to decompress after the fire. As a result, Haley acknowledged that she might have never fully processed the emotional stress of experiencing the disaster.

At the time of the wildfires, Anne and Hank were also contending with a family member undergoing chemotherapy treatment for cancer. Ironically, they were supposed to have this family member stay at their home while he received chemotherapy in the Kelowna hospital. Due to the wildfire, Hank and Anne needed to evacuate to this family members home instead.

Finally, looting was another compounding stressor, which also occurred as a result of the fire. Sadly looting is common in the midst of many disasters since it gives individuals opportunities to steal while no one is around. None of the study participants were victims of looting, so it did not appear to be linked with long-term distress for them. Nonetheless, the fact that looting occurred was upsetting to individuals, and was stated by some to have an effect on how they viewed the world and also what they perceived others were capable of. Sarah explained this in the following vignette:

One thing that did upset me is to hear that people, who did leave, a few of them had their homes looted—and that's just disgusting so . . . I wouldn't say it's a negative impact, but it really makes you think. I wouldn't have thought people would do that before.

Hank and Anne also mentioned the looting that occurred. Hank explained the difference for him between the threat of the wildfire (which was impersonal) and the threat of looters (which was personal). It seemed like he would be more distressed over someone looting his home due to the purposeful and malicious intent of the individual who stole from him. Hank elaborated on this concern in the following quote:

It was also the concern too that this is back country, everyone's got a quad up here, so they had people coming in, they had some break-ins down the hill, so

we're isolated and that was more of a concern for me. I mean if it [his home] would burn, phhewf, so be it, but if someone steals your property, that would be more personal.

Anne agreed, "That's just sick. People are going through this."

Compounding stressors that increased the overall psychological distress experienced by participants during the wildfires arose from a variety of sources. Firefighting personnel and community stakeholder participants were more often negatively impacted by stressors that directly related to the wildfires such as juggling dual roles or attending to the aftermath of the wildfires. However, these participants also experienced stressors that were of a personal nature. Alternatively, community residents tended to discuss compounding stressors that were related to personal matters more frequently. However, they too experienced compounding stressors directly related to the fire, such as Sarah's family who had their house for sale at the time of the wildfires. Although every participant spoke of some additional stressor that functioned to create more overall distress for them during the wildfires, most participants stated that their distress dissipated once the stressful issues were resolved. Additionally, most participants stated that they were not negatively impacted by these compounding factors over the long term. A brief section on the quantitative scales will now follow.

### **Quantitative Findings**

As mentioned in the Design section, quantitative scales were incorporated in this research as a means to validate the qualitative findings. There were some difficulties encountered when implementing the PDS, as noted in the Limitation section within the Discussion chapter; however, in general, the quantitative scales matched the qualitative

findings, both as a whole and on an individual level. I will now discuss the PDS in more detail.

**PDS.** The PDS measures symptoms of PTSD and is used as a tool by psychiatrists and psychologists to diagnose PTSD (Foa, 1995). There are six subcategories: (a) exposure to traumatic event, (b) re-experiencing, (c) avoidance, (d) arousal, (e) symptom duration or delayed onset, and (f) significant distress or impairment in daily functioning. In order to receive a diagnosis of PTSD an individual must score significantly in all six subcategories. As expected, almost all participants scored considerably below clinical levels to meet criteria for PTSD. One resident, Allison, met the criteria for five out of the six subcategories (subcategories a through e). In other words, she was close to meeting the criteria for a full PTSD diagnosis in that she was experiencing several of the symptoms; however, she indicated that they did not significantly impair her daily functioning. Moreover, her symptom severity level was only moderate.

About half of the individuals met the criteria for the first subcategory—exposure to the traumatic event. This indicates that participants did indeed perceive the wildfires as a traumatic event. Once more, in accordance with the open-ended interviews, the individuals who scored significantly in the subcategory were all residents. One exception was Hank, a resident who did not perceive the event as traumatic. However, as mentioned earlier, Hank is a retired police officer and stated that he did not feel that this disaster was particularly traumatic. Additionally, he reported that he had experienced or witnessed many other traumatic events in the past, the majority of which he deemed more traumatic than the wildfires. Moreover, Michael, a community stakeholder who was also

a resident, scored significantly in the first subcategory; this finding also validated his interview, since he spoke of feeling significantly affected by the wildfires and stated they were distressing for him. Jeff, the other community stakeholder, met the criteria for the second, third, and fourth subcategories (re-experiencing, avoidance, and arousal). These results seemed to fit what Jeff described he felt like directly after the wildfires; therefore, it is possible that he may have misinterpreted the directions and answered according to how he felt after the disaster and not how he felt at the time of the interview.

Alternatively, he may truly have felt this way when interviewed. However, he indicated that he did not consider the event traumatic (i.e., he did not meet the criteria the first subcategory); therefore, his results seem invalid in some ways. Nonetheless, the severity scores for the subcategories he scored significantly on were only moderate.

None of the firefighters met the criteria for any of the subcategories except for Steve, who met the criteria for the second subcategory (re-experiencing). However, his symptom severity was very low. In other words, Steve answered yes to experiencing several of the re-experiencing symptoms (e.g., thinking about the event and dreaming about the event), yet they were not severe or frequent. The PTGI, which is a quantitative tool for measuring PTG, will be discussed next.

**PTGI.** The findings for the PTGI are somewhat perplexing. As expected, several of the participants experienced PTG as evidenced by their higher scores. However, the level of significance was not as high as expected given their statements in the interview. As stated in the design section, the PTGI divides PTG into five subcategories (for further details on the definitions of each other these subcategories see the Design section): Factor I – relating to others, Factor II – new possibilities, Factor III – personal strength, Factor

IV – spiritual change, and Factor V – appreciation of life. The community stakeholders, Michael and Jeff, experienced some PTG in every subcategory; however, Michael only scored significantly in Factor I (relating to others). In contrast Jeff, scored significantly on Factors I, III, and V (relating to others, personal strength, and appreciation of life) and was very close to significant on Factors II and IV (new possibilities and spiritual change). These findings validate the qualitative findings for these two individuals. In particular for Jeff, who spoke extensively about the ways he experienced PTG.

Although the firefighting personnel experienced some growth on every subcategory within the PTGI (except Greg who scored zero for Factor IV), only Steve scored significantly on one subcategory (Factor III). Once again, these findings mirror what was found in the qualitative interviews. Especially Steve's interview, since he discussed feeling as if he had become stronger as a result of the 2009 wildfires. Additionally, Greg's findings were a little lower than expected because he seemed to engage in a lot of reflecting after the wildfire. However, he did not mention particular ways he had experienced PTG; he mainly discussed about the importance of considering the other angle of what could have occurred.

Lastly, the community residents' results were mixed. As expected, individuals who spoke of growth within the interview such as Allison and Sarah scored significantly on almost every subcategory. However, Hank, Anne, and Haley did not score significantly in any subcategory. Additionally, Hank and Anne did not report experiencing growth in every subcategory (i.e., they received a score of zero for some subcategories). In terms of Hank's interviews, the PTGI results matched what he expressed. He was generally unfazed by the wildfire disaster; therefore, he did not

experience much change in a negative or positive direction (i.e., the PDS or PTGI). The findings for Anne and Haley are somewhat surprising given the fact that they stated they had experienced significant PTG. This will be discussed in more detail within the Discussion section of this thesis.

### **Summary**

In conclusion, the four major themes that the researcher deemed most significant to report in this chapter were: perception of control, social support, factors related to posttraumatic growth, and compounding stressors and psychological distress. Since participants mentioned more positive than negative outcomes as a result of the wildfires, the themes were weighted accordingly (i.e., the themes focused more on positive findings as compared to negative ones).

For instance, the theme of social support was pertinent because it was mentioned as one of the main ways individuals overcame the negative impacts of the wildfires and displayed resilience. Social support was also tied in to the third theme, factors related to posttraumatic growth, as this third theme discussed factors such as social support that participants felt were important to developing PTG.

However, unlike the two themes mentioned above, not all of the findings were predominantly positive. The perception of control theme addressed how an individual's perception of control is related to psychological health—the less control the individual perceives they have, the more likely they are to experience psychological dysfunction. Alternatively, the more control participants perceived they had, the better the psychological outcome. Therefore, this theme discussed both positive and negative findings from the study. Perception of control was found to be very individual; however,

external factors in this study also contributed to the degree of control perceived by participants.

Finally, the fourth theme, compounding stressors and psychological distress, addressed the ways that individuals in this study were negatively impacted; this was largely due to experiencing the disaster, but was also compounded by additional stressors. Fortunately, participants did not generally report experiencing long-term negative psychological symptoms as a result of these stressors.

Due to the nature of qualitative research, this study yielded an abundance of data, which were too numerous to discuss within this thesis. Therefore, these findings were narrowed down to represent the themes that were mentioned most frequently by participants and appeared to have the deepest impact. Some of these findings have been repeatedly mentioned within the disaster research. However, some of the findings were more unique and require further research in order to uncover whether they can be generalized to a larger disaster population. These topics along with additional study interpretations will be addressed next, in the Discussion section.

## Chapter 5: Discussion

The discussion section has four major objectives, outlined in four main sections. The first section will explain the meaning of the findings for this study, answer the research questions, and draw conclusions regarding larger implications for wildfire research. The second section will suggest practical applications for contending with future wildfire disasters in Canada. The third section will address the study's limitations with reference to study rigor and trustworthiness within the context of potential sampling, temporal and quantitative instrument biases. Finally, based on the findings of this particular study, the fourth section suggests recommendations for future research.

### Interpreting the Findings

The purpose of this research was to uncover potential psychological or social factors that may influence individual distress and/or resilience following a wildfire disaster. The thesis was stimulated by the recently completed study that found some individuals in similar circumstances (i.e., lost property), but had different individual responses (i.e., varying levels of distress). Therefore, the second purpose of this research was to explore why some individuals maintain a healthier outlook, while other individuals experience significant psychological distress after enduring a similar event (i.e., experiencing the 2009 West Kelowna wildfires). In order to answer these questions, some background between the two study sites is needed.

**2009 and 2003 wildfire seasons compared.** The 2009 wildfires that were the focus of this study had significantly less property loss (BC Ministry of FLNRO, 2010; Filmon, 2004), and negative political and financial repercussions as compared to the 2003 Firestorm (BC Ministry of FLNRO, 2010; Filmon, 2004). For instance, there was more

controversy surrounding some of the disaster planning at the time of the 2003 wildfires. Filmon (2004) noted there were gaps in coverage: “the entire province [of BC] is not protected by well-thought-out and up-to-date emergency plans at the local level” (Filmon, 2004, p. 6). Further, Filmon stated that forestry and firefighting operations in 2003 experienced difficulties with organization and communication to the public and media; these difficulties translated to a more disorganized wildfire management during the 2003 Kelowna firestorm (Filmon, 2004). These difficulties have led to many lessons learned on federal, provincial, and local levels (Filmon, 2004). The 2003 fire season was the impetus for updating and improving Canadian disaster planning (Filmon, 2004); as a result, forestry and firefighting operations in 2009 were better equipped to deal with the wildfires. The Government of BC released a report that directly compared the two fire seasons and reported that the 2009 wildfires had “improved local government capacity to respond to emergency circumstances . . . improved information flow between the fire command structure and the public, and greatly improved partnerships and working relationships amongst all the key players” (Ministry of FLNRO, 2010, p. 2). Many of the key players in 2009 also had the added benefit of gaining experience from fighting the 2003 firestorm. For instance, both Greg and Steve mentioned they had aided in the firefighting efforts in 2003. Moreover, as suggested in the Findings section of this thesis, a large portion of the 2009 wildfire success (i.e., minimal loss of property) was due to the good fortune of the shifting wind direction, as it changed the fires path at the last minute (Ministry of FLNRO, 2010).

Such differences between the two fire seasons may lend a clue to potential factors that influenced differing individual psychological response to the fire. For example,

disaster severity appeared to be a factor linked to emotional well-being in this study. More specifically, the majority of participants explained that their lower levels of distress and lack of long-term negative impact after the wildfires was related to their perception of risk assessment, namely that after the wild fire changed its path, residents did not assess the wildfire to be a large risk. As reported in Mellon et al.'s (2009) article, a number of studies have found that "positive correlations have consistently been observed between the intensity and duration of exposure to trauma and loss and levels of psychopathology (e.g., Freedy, Shaw, Jarrell & Masters, 1992; Maercker & Herrle, 2003; Norris et al., 2002)" (p. 189). Briere and Elliott (2000) also found that symptoms of PTSD were positively correlated with "physical injury, fear of death and property loss" (p. 661). In contrast, the majority of participants in this study reported that they did not feel the wildfires were a severe disaster because of the generally successful outcome (i.e., very little property loss and no major injuries). Suar, Mandal, and Khuntia (as cited in Mellon et al., 2009) also discussed this in their disaster literature; Suar et al. found that "while persons living farther from the epicenter [of a disaster] also experienced traumatic circumstances, those living in areas with great damage reported higher levels of anxiety, depression and posttraumatic stress (pp. 189–190). Since there was minimal property damage in the 2009 wildfires, individuals experienced very little of the negative symptoms described above.

Additionally, participants held the perception that the emergency response plans were well thought out and the community was prepared; this appeared to mitigate psychological distress for study participants. Regardless of whether this was the case or not researchers have found that a person's perception of what occurred, rather than what

truly occurred, is more important to whether they experience psychological distress—“stress associated with threatening circumstances depends largely on individual appraisals of these circumstances (Folkman & Lazarus, 1980; Folkman & Lazarus, 1985; Folkman, Lazarus, Gruen, & DeLongis, 1986; Lazarus & Folkman, 1984)” (Prince-Embury, 1992, p. 39). In relation to this study, the participants did not perceive the wildfires as extremely threatening and, therefore, experienced less stress as a result. In this sense it would have been interesting to interview the individuals who lost property in this wildfire to determine whether they did in fact experience more negative psychological symptoms including a higher external locus of control (felt they were less in control and that factors outside of them were more in control), which have been mentioned by researchers as a result of increased loss and exposure (Mellon et al., 2009; Suar, Mandal, & Khuntia, 2002). Further discussion about perception of control will be addressed later in the chapter, but first, the quantitative scales will be discussed.

**Making sense of the quantitative scales.** Another aspect of the data collection—the PDS Scale—provided some information about the participants. As mentioned in the findings, participants as a whole scored low on this survey. In other words, no one met the criteria for PTSD and the levels of PTSD symptoms were generally low. Some individuals met the criteria for some subcategories on the PDS; however, only one participant was close to meeting the criteria for a PTSD diagnosis. This finding matched the qualitative findings within the interview. However, the reason for the low scores remains open to debate. As mentioned above, the most plausible explanation was because participants did not view the disaster as particularly traumatic. Alternatively, 2 years had passed since the wildfires and, therefore, their memories of the

disaster may not be as intense as they once were, which could lead to a misperception that they were not very traumatic at the time. Consequently, the reason for the lower scores on the PDS may be because of the length of time since the wildfires have occurred. Hobfoll et al. (2007) shared this view and asserted, “Most who initially present with symptoms of posttraumatic stress disorder will return to normal in the coming weeks or months” (p. 87). Therefore, study participants who may have presented with higher PTSD symptom levels right after the fire event, have likely regained their psychosocial balance. Further research exploring this issue needs to be conducted to definitely determine whether there were changes in participants’ perceptions of distress, and if so, to ascertain the reasons for such changes and at what time period the changes occur. This will also help determine the types of mental health services that are required and the length of time that the services are needed. Possible explanations for the PTGI findings will now be discussed.

According to both the qualitative interview and the PTGI, participants in this study experienced PTG in several areas of their lives. In relation to their qualitative interview answers, some residents scored lower than expected on the PTGI. More specifically, Anne and Haley marked their PTG as below significant within the PTGI. Additionally, they both met the criteria for at least one of the subcategories on the PDS—Haley met criteria for subcategory B (re-experiencing) and E (symptom duration/delayed onset), Anne met subcategory A (exposure to traumatic event). However, the subcategory A simply means that Anne felt the event was traumatic and the subcategory scores for Haley were barely significant; therefore, her symptom severity was not very high. These findings could be explained in several ways; however, it is this researcher’s

belief that social desirability was most likely the explanation for Haley's incongruent quantitative scores. Her findings were the most inconsistent between the qualitative and quantitative instruments. Consequently, she may have felt pressure to tell the researcher she experienced more positive effects as a result of the wildfire than she actually did. Moreover, although Anne discussed using humour to cope and appeared to find support in her husband, she also described herself as a worrier. Perhaps factors such as humour and support merely served as buffers for her to mediate the development of PTSD symptoms; however, she did not experience long-term growth (i.e., PTG) as a result. These inconsistencies need to be researched further in order to draw any definite conclusions.

The second finding of note in the PTGI was that PTG seemed to be common in all subcategories except for spiritual change. It may be that individuals in this study were not particularly spiritual to begin with, or perhaps spiritual change is more common among individuals who felt as if their lives were more seriously threatened. Most individuals in this study reported that they did not particularly feel as if their lives were in danger at any point. More research needs to be done to explore possibilities that promote spiritual growth.

### **Perception of Control**

As previously mentioned, Suar et al. (as cited in Mellon et al., 2009) found that "respondents who experienced greater trauma and loss reported more external locus of control beliefs and more component behaviours of psychopathological conditions" (p. 190); therefore, it seems logical that participants in this study who viewed the disaster as less severe may have felt a higher perception of control (or in other words, an internal

locus of control) during the wildfires than the Barriere residents did who endured greater trauma and loss (Mellon et al., 2009; Prince-Embury, 1992; Suar et al., 2002). This finding leads us to more closely examine perception of control. In fact, the findings suggested that perception of control was a large component linked to psychological health. For instance, because the firefighting efforts were prompt and generally successful, participants felt the disaster was handled effectively, and did not feel as though they lacked control for an extended period of time.

**Primary versus secondary control.** Rothbaum, Weisz, and Snyder (1982) proposed that the concept of control is more complicated than merely contrasting internal versus external locus of control. Rothbaum et al. postulated that there were two types of control that still instilled the individual with the perception of control; however, one was stronger than the other. The first type is aptly named primary control and occurs when the individual attempts to change the environment to meet his or her needs. When an individual fails at his or her attempts to acquire primary control, Rothbaum et al. (1982) posited that they would strive for secondary control, which occurs when the individual “attempts to fit in with the world and ‘flow with the current’” (p. 8).

Kumagai, Bliss, Daniels, and Carroll (2004) discussed this concept of control in their research on wildfire and property owners within the wildland–urban interface (WUI). Kumaga et al. applied findings from Rothbaum et al. (1982) to interpret their data and reported that “when people cannot execute primary control over their situation, they seek secondary control. In this sense, extinguishing the wildfires or protecting their homes by themselves would have been the primary control; obtaining fire information or

knowing that firefighters were protecting them would have provided secondary control” (Kumagai et al., 2004, p. 123).

In addition, individuals who were the most negatively impacted as a result of the disaster listed instances where they experienced the sensation of lacking control. For example, participants noted only having one exit route, having very little time to evacuate, and acknowledging the luck involved in the path that the fire took as reasons why they felt distressed. These are all examples of elements that were beyond individual control; therefore, participants would not fall under either category of primary and secondary control. Rothbaum et al.’s (1982) work will be discussed more later; the next sections will address behavioural and internal factors that influence control.

**Engaging in behaviours.** Engaging in behaviours to empower oneself was connected to perception of control in this study. For instance, helping others during the wildfire or taking steps to FireSafe property after the wildfire appeared to increase participants’ perception of control. However, it is difficult to ascertain whether people needed to feel a greater internal sense of control before they were able to engage in these helpful behaviours. Previous research supports this hypothesis; studies have found that “believing one has some measure of control over the threat leads one to take actions to reduce risk” (Pijawka et al., as cited in Carroll, Cohn, & Blatner, 2004, p. 2149). Moreover, other disaster theorists contended that “perceptions of uncontrollability and decreased motivation for control fuel one another in a downward spiral” (DuCette & Wolk, 1973; Koller & Kapland, 1978). As a result, individuals turn inwards, feeling helpless, which is exhibited by submissiveness, withdrawal and lack of action (Rothbaum et al., 1982). Therefore, it appears individuals predominantly need an internal locus of

control in order to take measures to further empower themselves. In the practical applications section, ways to increase individuals' internal perception of control are discussed.

**Internal factors.** Personal philosophies and internal beliefs about one's capability also appeared to be linked to overall perception of control. For example, the findings revealed that a sense of competency, and other dispositional factors such as a tendency to be anxious or nervous, influenced how well individuals coped with the disaster. Therefore, internal resources may be a difference that influences perception of control, despite experiencing similar external circumstances. More specifically, a sense of competency in this study was linked with a higher perception of control. These findings mirror Paton's (2005) work; Paton found that rescue workers have an increased perception of competency and self-efficacy, which have also been linked to perception of control. Moreover, this finding is not unique to firefighters; in general, Taylor and Brown (1988) found that competence was related to ability to overcome setback and feel more in control.

In contrast, personality traits such as anxiety and neuroticism were connected with a lower perception of control in this study. However, it was very difficult to find specific articles that discussed the link between personality traits and perception of control. It seems this is because emphasis on personality and locus of control was more common in the 1980s. Since then, researchers have veered away from personality research within this context (Spector & O'Connell, 1994). Nonetheless, a few research studies, such as Spector and O'Connell's (1994) work, linked negative affect, defined as "the tendency for an individual to experience a variety of negative emotions across time and situations"

(p. 2), locus of control, and stress. Namely, those with negative affect personality types experienced more stress and tended to possess an external locus of control. However, this was related to work performance and not specifically disaster research. Moreover, NA encompasses a broad definition of negative emotions and not specifically anxiety or neuroticism. In this study, it seemed that participants who were more anxious experienced extra distress during and directly after the wildfires. However, their anxiety appeared to be, at least partly, related to a need for control, so perhaps this is evident in itself. In other words, a cycle existed—these participants were more anxious because they had a higher need to be in control; therefore, they felt more anxious when they could not be in control. This discussion and the lack of a penultimate conclusion further clarified that more research is needed on this topic.

Internal factors also seemed to be precursors for the participants' ability to accept when they lacked control. For people with dispositional qualities that tended to be more anxious and had a higher need for control, accepting when they lacked control was more difficult. As discussed in the findings section, the ability for one to accept when they lack control can be beneficial and healthy, particularly in a circumstance such as a wildfire, as there are certain things that are beyond the control of individuals. Knowing the difference between what one can control and what one cannot control was found to be an important coping strategy that was linked to decreased distress.

All of the above findings on internal factors that influence perception of control suggest that an individual's internal capacity to mediate perception of control may be situated on a continuum; if uncontrollable external factors rise in frequency, more individuals may find they lack sufficient internal resources to retain their perception of

control. However, they can readjust their perceptions and attempt to gain what Rothbaum et al. (1982) termed “secondary control” (p. 8). This is akin to what participants like Jeff and Allison underwent. After experiencing the 2009 wildfires and experiencing the accompanying distress from their inability to control certain aspects, Allison and Jeff essentially renegotiated their worldviews to adapt. This is similar to accommodation in Piaget’s (1971) theory of cognitive development. “Accommodation is the tendency to modify one’s cognitive structures in an attempt to effect a better fit with reality” (Rothbaum et al., 1982, p. 8). This led to PTG for these two participants in the way they viewed the world as well as how they viewed themselves (i.e., appreciation of life and inner strength).

**Support.** The findings indicated that feelings of helplessness could be mediated with support; therefore, when individuals feel a personal dilemma is exceeding their capacity to cope, they may turn to others for support (Mellon et al., 2009). For instance, Cohen and Hoberman (1983) termed this phenomenon the buffering hypothesis and suggested, “High levels of social support protect one from stress-induced pathology” (p. 100); this finding has been mentioned in many other studies (Cohen & Hoberman, 1983; Morrill et al., 2008; Tang, 2006). The findings in this study further supported these ideas; participants listed support as a large factor that decreased individual distress. For example, Steve discussed the support and camaraderie that existed among the firefighters and how this helped him function in the midst of a stressful emergency. It may be that support serves as not only a buffer but as a type of “booster,” which increases individuals’ sense of empowerment and offsets feelings of helplessness and distress. Moreover, support may also increase the likelihood of experiencing PTG. For instance,

participants in this study stated how debriefing was thought to help decrease distress and influence the form of PTG, which is known as connecting with others. This study suggested that support might have a cyclical relationship with PTG, where one simultaneously fosters the other.

In contrast, other studies have found that government support was correlated with residents' identification with external locus of control (i.e., they felt less in control). Mellon et al. (2009) hypothesized that support from the government contributed to feelings of learned helplessness and decreased personal empowerment and also questioned "whether comprehensive public responsiveness to disasters might inadvertently exacerbate a potentially pernicious dependence on assistance in survivors (Reich, 2006)—a dependence tantamount to an external locus of control of reinforcement" (p. 190). This points to the consideration of examining support in a different manner. Further recommendations for this will be listed in the following section.

**PTG.** In addition to support, the findings revealed that engaging in particular behaviours during, and directly after, the wildfires was thought to be connected with less distress and more PTG. These behaviours included debriefing, self-care, reflection, and the use of humour. Although most participants spoke of engaging in more "informal debriefing" such as talking to a friend or family member; formal debriefing did not occur for most participants. Further, several participants mentioned debriefing as a way to improve individual and community resilience after a wildfire. Within this study it seemed that participants intuitively engaged in particular self-care behaviours to offset emotional distress. However, if the findings suggested that these behaviours are linked

with PTG, more conscious efforts should be aimed at promoting these behaviours. Additional research should be devoted to discovering other behaviours that can also contribute to the development of PTG. This finding will be discussed in more detail in the practical applications section.

**Compounding factors.** Besides the relation between perception of control and psychological distress, additional, compounding stressors were other factors that were linked to psychological distress in this study. These additional stressors included contending with significant personal issues at the same time as the wildfires, being responsible for the aftermath of the wildfires (in a political, financial, or physical sense), or feeling torn by multiple roles during the disaster. Most of these issues did not appear to lead to long-term psychological distress. Once more, the absence of long-term psychopathology or negative psychological symptoms appears linked to the fact that there were no severe repercussions of the wildfire disaster in terms of property loss and injury. Moreover, participants mentioned more positive than negative themes from experiencing the wildfires (i.e., increases in PTG, success of firefighting efforts, high degree of support, etc.). However, the findings indicated that overall, the firefighter personnel were the least negatively affected participants. Previous research asserted that participants' increased resilience was a result of their experience and training for this type of disaster (Paton, 2005). Due to the fact that rescue work attracts a particular type of person with specific dispositional traits, which are suited for the type of stresses in the occupation (Paton, 2005). Some personality traits mentioned were "extraversion, openness to experience, agreeableness, conscientiousness, self-efficacy, optimism and hope" (Paton, 2005, p. 337). This description fits Steve, who explained how fighting the

wildfire was the best moment in his career. He seemed to crave excitement and, like Greg and Michael, Steve mentioned how things seemed mundane after the wildfires were over. Greg drew a further distinction between firefighters and residents when asked about whether he experienced any particular emotions in the midst of the disaster:

You know you really don't have a lot of time, you know, and I think that's probably what you'll find from most emergency service workers when we do our job, is if you're an off-duty public bystander, it's a totally different mindset, that you're looking at something, you're looking at it as a disaster, where we're looking at it as our work and how we gotta fix it.

Here Greg mentioned that firefighters have a problem solving mentality. Greg also inferred that firefighter training contributes to their ability to cope with the wildfires.

Alternatively, Haslam and Mallon (2003) asserted that disaster workers are exposed to much more trauma, which could compound and lead to psychological disorders if they are not adequately dealt with. Therefore, evidence is conflicting regarding whether firefighters have a better capacity to handle disasters than residents.

Of note, was that the firefighting participants were also all male; therefore, the difference in distress levels may have been more related to gender (World Health Organization, 2002). Especially since Hank, who was not a firefighter, was also relatively unaffected by the disaster. However, he was a retired police worker, so perhaps the same logic regarding ability to handle distress due to occupational factors applies to him as well.

Some research found that female gender was “a risk factor to develop psychopathology after disasters” (Norris et al., as cited in Papanikolaou, Adamis, Mellon,

Prodromitis, & Kyriopoulos, 2011, p. 136). Further, in an Australian study on bushfires, Eriksen and Gill (2010) found that “the lack of engagement by women with bushfire issues results in the high levels of apathy, denial and feelings of helplessness recorded amongst female interview participants” (p. 821).

In contrast other studies have found that the male gender display more negative effects after a disaster (Papanikolaou et al., 2011). After a double disaster in Greece consisting of an earthquake and a wildfire, Papanikolaou et al. (2011) discovered individuals with significant psychopathology

were more likely to be males and to have completely lost their property by the two disasters; it seems that during the time between the disasters, they had tried to rebuild their property but the new disaster destroyed everything again. (p. 135)

Due to the fact that the males expended more effort in rebuilding, they were more negatively affected when their property was destroyed. However, Papanikolaou et al.’s (2011) was unique because it was based on the experience of two back-to-back disasters.

Due to the fact that this research study’s sample size was so small, it was very difficult to ascertain whether the finding of less distress within the firefighter participants was coincidence or if there was some significant factor at play. Moreover, it is unknown whether this resilience was related to gender, occupation, or neither. Afterall, there is evidence to support that these findings are linked to both gender and occupation, and there is evidence to refute both demographics. Further research needs to be conducted in order to determine the cause for the enhanced resilience in these participants.

In addition to negative effects listed by participants, the interviews also functioned to generate ideas about how to improve the quality of life for West Kelowna

residents. Most participants stated that they felt they lacked a sense of closure after the wildfire and would have liked a type of formal debriefing for the community. Specific statements and recommendations will be supplied in sections to follow.

In conclusion, there were many psychological and social factors found within this study that influenced individual distress and resilience after the wildfires. Possible social examples include: the severity of the disaster, the level of organization and preparation, social support, the time elapsed since the disaster, and social desirability factors. Perception of control was the most prominent finding linked to variations in distress and resilience. Secondly, the subsequent purpose of this study was to discover potential factors linked to varying levels of psychological distress despite experiencing a similar event. Potential factors that were found in this study were related to perception of control, sense of efficacy, demographic factors such as gender and occupation, and other dispositional traits. Support was found to be a buffer for psychological distress and also appeared to contribute to the development of PTG. Other positive behaviours such as debriefing seemed to function to offset distress and foster PTG as well. Suggested practical applications for these findings will be discussed next.

### **Practical Applications**

Based on the interpretation of the findings above and their potential for generalizability to larger wildfire survivor populations, this section addresses some practical applications that could be implemented. It begins with specific suggestions for the West Kelowna area and follows with potential applications on a municipal, provincial, and federal level within Canada.

One of residents' greatest concerns pertained to the fact that only one exit was easily accessible for an evacuation. The majority of Glenrosa resident participants mentioned this was a source of anxiety for them that needed to be addressed. Therefore, creating a second escape route for Glenrosa residents in the event of a wildfire emergency is the first practical suggestion for the community of West Kelowna. Moreover this concern of only one escape route is not unique to West Kelowna; for instance, several exit routes were also cut off during the Slave Lake, Alberta, wildfire in 2010 ("Fire Destroys 40%," 2011). As such, municipal and rural areas situated on the WUI should follow Kelowna's lead: after the 2003 firestorm, Kelowna has placed a much larger emphasis on disaster planning. Building areas with multiple escape routes is at the forefront on recent urban planning in Kelowna (Paris, 2011). This finding also has broader applications for other rural areas and municipalities in Canada that are situated within the WUI.

Secondly, most community residents mentioned their desire and need for more formal debriefing after experiencing this disaster. They explained that there was a community meeting regarding the wildfire; however, residents in this study felt that the time between the actual wildfires and the meeting was too long. Individuals specified what subject matter the debrief session should address as well as who should be present. In the following vignette, Allison mentioned the type of debrief session that she would like to see implemented in the event of a subsequent wildfire:

I would like to have seen, sort of a neighbourhood debriefing, you know, of things that had worked and didn't work, with mayor, council, fire department, um neighbourhood, right? That didn't happen—individual groups, yes, but it would

be nice I think, or it would have been nice to say, “Okay, this is what we found didn’t work and what can we do about it as a neighbourhood,” right? So things like that . . . it would have been cathartic I think for the neighbourhoods to have that opportunity.

Kulig et al. (2011) discovered similar findings in the mixed-method study on the 1999 Mallard fire and the 2003 Barriere wildfire. Kulig et al. (2011) stated, “Providing opportunities for local residents to gather and reflect on the disaster experience thereby building their networks and developing opportunities for interaction” (Kulig et al., 2011, p. 2) is an important step for recovery. Additionally, Kulig et al. (2011) suggested organizing celebrations to help foster social support “while also creating a sense of belonging and community” (p. 2). Allison mentioned this type of gathering and explained its application on a broader scope: “I think that would be—in any neighbourhood, I think that would be a cathartic thing to do, is just sit around and just, okay, ‘What happen to you, how do you feel?’”

Similarly, Haley also mentioned she felt the need for a community debriefing after the wildfire, but specified that it should have involved the entire municipality of West Kelowna. Haley stated many of the same rationale for a debrief session as Allison did; additionally, Haley felt that local government, firefighters, and residents should be present—underscoring the importance of community residents being present. These findings suggested that formal debriefing could be important for emotional processing as well as gaining a sense of closure. Additionally, formal debriefing can function as a collaborative way to generate improved mitigation strategies for the future. Emphasis should be placed on a collaborative debrief session, including all community members,

government, business owners, community residents, and so forth. Moreover, all members' input must be equally valued during the debriefing.

Steve also discussed the importance of debriefing, both during and after the fire. During the fire he proposed having a debriefing at the end of each shift that focused on the emotional impact of fighting the fires, and not just the technical components:

On a long term incident like that, there should be . . . I think maybe one [debrief] after every shift, but it should be—and this is my opinion, is, we're not talking about what's going right out there, what's going wrong, we just wanna know how you felt today. Like you know what, we'll have an incident analysis after and talk about all the operational stuff and as we work through this three, four, five day fire, we'll constantly try to improve, but let's just talk about how we feel out there . . . even if it's just 15 minutes, like, "Oh my God, I'm tired, and I gotta get some sleep," and then you can understand, you know, if someone, maybe they have stresses at home on top of their fire stress, and people could appreciate that maybe they're a little extra cranky and stuff.

Steve explained how after they had contained the fires they launched directly into rehabilitation and the fire station did not have a debriefing. He acknowledged that it should have been done, as it would have been beneficial for their crew. The following vignette by Greg may explain one of the reasons debriefing was needed. Greg explained the difficulty with returning to day-to-day routines and how it felt anticlimactic after the wildfire experience:

The biggest thing that you find after going through a major incident like that is that everything else seems pretty . . . undramatic for a while, you know what I

mean? Like a regular house fire or a small fire just seems . . . so small, compared to—you just dealt with something way above the normal scope and so it just becomes this huge—so it becomes a huge scope and then all of a sudden you come down. It’s like playing for the Stanley cup and then all of a sudden you’re playing a regular game it’s kind of the same analogy, you know, you just got called to the biggest game of your career and it went pretty good and then, then you fall back into the . . .

The interviewer asked, “The mundane stuff?”

Greg explained, “Yeah, and I think the hardest part is making that transition into your regular day-to-day routine again.”

Michael and Steve mentioned experiencing this anticlimactic feeling after the wildfires as well. Michael acknowledged that he had some depressive symptoms afterwards due to boredom. He stated experiencing a huge adrenaline rush during the disaster and feeling as if he abruptly transitioned back into the routine of everyday life, which appeared monotonous in comparison.

Personal debriefing in the form of counselling is also important for individuals after a wildfire. Although counselling is usually offered to individuals during an emergency, it is usually only available for a short period afterwards (Kulig et al., 2011). New findings from Kulig et al.’s (2011) research study recommended longer-term counselling after a disaster (Kulig et al., 2011). Secondly, Tang (2006) argued that “mental health programs should focus on promoting active coping strategies such as support seeking, strengthening of support networks, and management of posttraumatic stress symptoms to facilitate adjustment” (Tang, 2006, p. 699).

Allison spoke about longer-term counselling in her interview as well. She explained why individuals may initially turn down counselling, but then feel like they need it a few weeks later:

Yeah, and that's one thing that you do find, is that at the time, you're sort of on auto-pilot, and it doesn't hit you till afterwards. If they [emergency relief staff] ask you, "Well, do you need to talk to somebody?" You go, "Nope, things are under control" . . . and then two weeks later, you're going, "Whoa, I don't feel that great," you know, "or I'm having nightmares," so I think we should have something in place maybe, later on.

Secondly, even if resources are available, individuals do not always make use of them. One reason for this was mentioned above by Allison—residents are still experiencing shock and feel okay directly after the disaster.

A subsequent reason is due to stigma around mental health services; this is particularly true in rural areas where there is an increased stigma around seeking out mental health services (Boydell et al., 2006). Moreover, although organizations have resources for individuals who need emotional support (i.e., employment assistance programs), the findings from this study suggested that some work cultures may have an unspoken rule that discourages utilizing these services; however, it is uncertain whether the staff or the leadership or a combination of both propagates this view. Jeff discussed how this type of attitude could be present within forestry. He commented on a culture within forestry that is not always conducive to seeking emotional support. In addition, many individuals may minimize the significance of their own distress and fail to seek support when necessary:

I think this is one of those areas—like one of those industries, where emotional well-being is just sort of like given lip service, and it's like, yeah, critical incident stress. There's a phone number, it's like yeah, we're just sort of going through the motions by making people aware of it, but actually doing it can be really difficult because, it's like, "Do I really need it?" Or something like that.

Jeff went on to explain how he has started addressing the importance of dealing with stress after a critical incident in his workplace when he trains staff. Jeff stressed that more attention should be placed on this issue.

In sum, the findings revealed that it is important to have some type of formal debriefing at every level (i.e., personal, organizational, and community levels). Debriefing was shown in this study to induce reflection, which was linked to the development of PTG. Additionally, since PTG develops over time (Bonanno, 2004), this researcher recommends follow-up community debriefing that focuses on identifying PTG areas; therefore, questions to community members should elicit answers regarding what was learnt, how relationships have been impacted, and what new behaviours are residents engaging in (either related to wildfire mitigation or overall quality of life enhancement). In order to facilitate proper debriefing, the municipal government needs to have a faster response time between the incident and the debriefing so that the issues are still at the forefront individuals' minds. Further, federal and provincial government need to support this initiative through funding (Canadian Council of Foreign Ministers, 2010). Finally, in order to encourage the utilization of resources, stigma must be reduced within organizations and communities. This is especially true for rural communities since they tend to contend with more stigma. This researcher recommends decreasing stigma by

talking about these issues on a larger scale (i.e., community debriefing), so that seeking out emotional support becomes more accepted within the community. Moreover, free, individual counselling services need to be available for a longer period of time after the disaster (Canadian Council of Foreign Ministers, 2010). In addition, individuals must take initiative to acknowledge when they need to seek out emotional support. Education and awareness on wildfire risk reduction has been previously promoted by the government (Canadian Council of Foreign Ministers, 2010). However, this researcher also recommends further education on the importance of debriefing to encourage and normalize the process.

The importance of debriefing in this study is a significant finding given that the 2009 West Kelowna wildfires did not cause severe community disruption. When “loss of property and income together with life threat were significantly related to distress in previous studies (e.g., Gibbs, 1989; O’Neill et al., 1999; Freedy et al., 1994; Smith, & Freedy, 2000)” (Papanikolaou et al., 2011, p. 137) it underscores the importance for debriefing after wildfires or after other disasters that are more traumatic for residents and rescue workers.

One final application refers to increasing individual and community preparedness for wildfires. Federal and provincial and municipal government have already taken significant initiatives to promote this agenda by its attempts to improve resident awareness and encourage FireSmart practices—“an initiative to promote wildfire prevention methods among home owners and communities” (Ministry of Forests & Range et al., 2008, p. 28)—especially since the 2003 fire season (Canadian Council of Forest Ministers, 2010). However, because so much distress seemed linked to lack of

control in this study, I propose more strategies come from a perspective of fostering personal empowerment as a way to bolster personal control (Canadian Council of Forest Ministers, 2010; Ministry of Forests & Range et al., 2008). Focusing on increasing neighbourhood collaboration (Kulig et al., 2011) could be one method to make FireSmart practices appear more feasible and relevant, and as well as function as a way to hold residents accountable for maintaining these practices (Westhaver, 2007).

In conclusion, the practical applications recommended by this researcher include a variety of strategies. In terms of local recommendations, there is a need for multiple escape routes and more formal debriefing. However these strategies apply on a broader level as well. Moreover, organizations need to ensure they are debriefing after wildfire incidents. Although this research confirmed the importance of continuing to improve mitigation and disaster plans, this is not the only aspect that should be included in community debriefing. Emphasis should also be placed on emotion and coping strategies. Increased community exposure to this type of debriefing can function to normalize this process and facilitate support-seeking behaviours in individual residents. In this sense, individual counselling needs to be offered for a longer period of time after the wildfire. Finally, finding ways to get community members involved in FireSmart activities can serve to empower them and foster community support.

Although this research may offer some important contributions for wildfire research in Canada, which will be outlined next in the Strengths section, there are some significant limitations in this study as well. Further, limitations could impact the study findings. These strengths and limitations will now be addressed.

## **Strengths and Limitations of the Study**

**Strengths.** The strengths of this study lie in the fact that its focuses on topics that have been substantially understudied. For instance, it was conducted in Canada and studied municipal firefighters and residents; whereas most wildfire studies have researched countries such as the United States and Australia and have explored the psychological impacts of disaster relief workers (see literature review). Further, this research chose to concentrate on factors of individual resiliency and PTG, in addition to negative psychological symptoms and psychopathology. There are very few studies which explore the topic of wildfires and PTG; moreover, as far as this researcher is aware, none of these studies were conducted in Canada.

Further, while the sample size was small, this study's sample was diverse in that it included community stakeholders, residents and firefighting personnel. This mixed sample can aid in obtaining a more well-rounded view of the wildfire event. Also, in terms of international and Canadian disaster planning and mitigation, very little emphasis has been placed on mental health – more often policy devotes more attention on practical risk reduction and mitigation strategies.

A final strength of this study was the fact that the quantitative instruments were incorporated in addition to the qualitative interviews. This mixed-methods design increased the study's validity by providing added support that what was reported within the qualitative interview was corroborated by the quantitative scales. This type of cross-referencing also served to increase the trustworthiness and rigour of the study. Despite the study's multiple strengths, it also has limitations; these will be discussed next.

**Limitations.** Limitations are inevitable in every research study, and this research project is no exception. This is especially true due to the time constraints of this research project and the lags between data collection and analysis. The limitations within this study fall into three major categories: temporal, sampling and instrument limitations. These limitations will be outline below.

*Temporal limitations.* Since part of the study is retrospective in the sense that participants must think about their experiences and reactions after the disaster, certain limitations are inevitable. For instance, memory is not always as accurate in retrospective studies (Heinrichs et al., 2005). This is particularly true in research where participants exhibit PTSD symptoms since this disorder impacts the ability to recall (Heinrichs et al., 2005). Although no participants met all the criteria for PTSD, some of them displayed certain isolated symptoms reliving the event (e.g., through repeated memories of the event, dreaming about the event, etc.), and arousal symptoms (startling more easily, hypervigilant, etc.); therefore, it could be argued that participants who do exhibit some of these symptoms may not have as clear of a memory regarding the disaster. Secondly, some participants had experienced subsequent and significant trauma since the 2009 wildfires, making it difficult to tease apart which symptoms were experienced as a result of the fire and which affects were due to the additional trauma participants had experienced. For instance, two participants, a husband and wife, had both experienced a large natural disaster in 2010. Throughout the qualitative portion of the interview they often referred to this disaster when discussing trauma and had to be redirected back to thinking about the wildfires. However, it appeared that they learned a lot—both positively and negatively—from experiencing the subsequent disaster in 2010,

and considered this a much larger trauma. It is difficult to ascertain whether experiencing the 2009 wildfires had any effect on their ability to cope with the 2010 disaster.

Further issues of compounded trauma arose when participants completed the PDS, since it presents an assortment of traumatic events and asks individuals to check-off all options that apply to them. Afterwards, the assessment tool requested that the participants name the most traumatic event and take the test according to symptoms experienced from this event. Often times, the wildfire was not the most traumatic event people had experienced, even if it was the most recent; for instance, several participants named things like assault, witnessing an accident, or being in an accident as more severe and traumatic past events in their lives. The researcher then, had to make a decision in the moment and requested that the participants fill out the assessment according to the wildfire experience, even if it was not the most traumatic event they had checked-off. The reasoning was that although the test would be less valid in the sense of measuring a participant's overall level of PTSD, it was hypothesized that there may be a more accurate measurement of the PTSD symptomology associated with the wildfire. This was a difficult dilemma because, as human beings, we are potentially barraged with difficult and traumatic situations everyday; therefore, unless this study was conducted directly after the wildfire, it would not be possible to obtain an accurate reflection of the degree of trauma they experienced. Even if the research was conducted directly after the wildfire, people's previous life experiences would have impacted how they perceived the wildfire event. Since human beings do not live in a vacuum, it is impossible to separate the wildfires as an isolated variable. It would have to be questioned, then, if that defeats the original objective of the research—since previous experience most likely functions as

psychosocial factors that interact with participants probability of experiencing PTSD and PTG.

Another temporal limitation in this research pertained to the fact that there were two waves of data collection that were separated by six months. The firefighting personnel and the community stakeholders were interviewed in April 2011, and the community residents were interviewed in October 2011. It would have been ideal if all interviews were conducted at once and preferably in April, since that was closer in time to the wildfire event. Unfortunately, due to other concurrent professional and personal responsibilities, this was not possible. It is difficult to determine in retrospect whether the interviews would have been different six months prior or six months later.

Finally, in accordance with successive approximation analysis methods the data are meant to be collected and analyzed in quick succession so that the categories derived will closely coincide with the participant data (since the researcher's memory of the data collection is fresh and easily accessible). However, data analysis did not begin until November 2011, which was after the second trip to West Kelowna. Fortunately all participant recordings were very clear; therefore, it was not difficult to ascertain participants' answers to the open-ended interview.

*Sampling limitations.* Originally the researcher planned to make a separate trip to West Kelowna prior to conducting interviews in order to personally introduce herself to potential participants as well as make her presence in the community known. Ideally, this presence within the community would have allowed for personal connections with residents and increase the likelihood of participation. Therefore, purposeful sampling was to be employed by inviting individuals who spoke to the writer or community

stakeholders regarding mental health issues, or who had specific experiences with the fire that may lead to a discussion of mental health issues (e.g., those who lost homes and those without insurance). Unfortunately, time and money were not available to allow for this preliminary trip to West Kelowna. Perhaps if this trip had occurred it would have been possible to connect with and recruit more participants who were more significantly impacted by the wildfire such as the owners of the mill and the individuals who lost property.

However, the likelihood of this occurring is difficult to foresee, since these individuals proved to be very difficult to locate in the first place. Nevertheless, had the researcher been able to recruit these participants, it is likely that much more negative themes would have emerged and more PTSD symptoms would have been present within participants, since trauma is positively correlated to the degree of exposure to the disaster. Also, according to some literature, PTSD and PTG may not be mutually exclusive; therefore, higher levels PTG occur with increased intensity and exposure to disasters as well. More specifically, in accordance with PTSD symptoms, levels of PTG may have also been much higher in the participants referred to above. Unfortunately, because there were only three homes and one trailer lost in these fires, it was not possible to interview any of the individuals who lost property.

Three individuals who were mentioned in the media as people who lost property, were contacted by the researcher in April, but only one person responded. This person agreed to be interviewed during the next wave of data collection; however, when contacted in October, the individual declined stating that he did not have time to participate. This is viewed as both a limitation and possibly a success. Because no one

in the study lost property, the sampling and the themes were more consistent than had there been one person who lost property within the sample. If at least three or four people who lost property agreed to participate in the study, data saturation would more likely have been reached; however, with just one participant, the themes that arose from this interview would have most likely been very different from the other interviewees who spoke of more positive aspects and successes from the wildfire. Therefore, the fact that this one individual declined to participate was not a large limitation in this sense.

A second sampling limitation refers to the Community Stakeholder (i.e., participant codes beginning with “A”). It was difficult to categorize these individuals at the onset of recruitment because little was known about them besides their occupation. Although their occupation initially implied they fit into the A subcategory, their interviews suggested that they may have fit other subcategories better or equally as well. For instance, Michael was both a community stakeholder/administrator as well as an evacuated community resident at the time of the 2009 wildfires. Therefore, his story in the open-ended interview switched between both roles. In hindsight, Jeff was better suited in the firefighter category, since he was physically at the wildfires and not behind the scenes making decisions. Since individuals do not fit neatly into categories, it seems inevitable that overlap would occur. However, the issue with this pertains to analysis, since it is difficult to make clear distinctions and comparisons between the community stakeholders and the other subcategories. In this sense, the analysis was limited.

One positive thing resulting from this limitation, however, refers to a particularly significant finding: “dual roles” was a theme that emerged among most of the participants in both A and F subcategories. Therefore, these unclear distinctions and boundaries

served to uncover a particularly relevant finding, which informed the tail end recommendations. This was discussed in greater detail in the findings and discussion section of the thesis.

Although obvious, the sampling size must be mentioned in this limitation section. Despite participants' rich description and heartfelt expression of their individual stories, the sample of only ten individuals cannot be generalized to a larger population of wildfire survivors. Additionally, the sample was further subdivided to encompass different types of participants—namely, community stakeholders, community residents and firefighting personnel—making the likelihood of generalizing to these populations even smaller. Despite this limitation, generalization of this sort was not the main objective of the research – hence the purposeful selection of qualitative methods. In contrast, since this subject matter is poorly researched and therefore, poorly understood, this study was meant to serve as a stepping stone for evidence for additional wildfire research within Canada, by identifying possible topics that could be explored further. In this sense, I believe the research achieved its objective; however, the reader must keep in mind that it would not be suitable to generalize this small of sample size to the larger population.

A final limitation referred to location bias, since only one out of three wildfires was extensively researched. Originally, this researcher's aim was to explore the personal impacts resulting from all three wildfires that occurred during the summer of 2009; yet in reality, only Glenrosa residents were interviewed. Thus, most of the participants refer primarily to the Glenrosa fire when discussing their personal experiences. Had the participants resided in other neighbourhoods close to the Terrace Mountain and Rose Valley fires, emergent themes may not have been so uniform across participants.

Although once again, this is simply speculation; it should also be noted that many of the central themes resulting from this research refer to broader, more universal human themes. In other words, most themes were not related to specific aspects of the Glenrosa wildfire.

*Instrument limitations.* As mentioned previously certain biases may have arisen, which, in some cases, could have been a factor related to the two modes of measurement (i.e., qualitative and quantitative) yielding slightly different results. For instance, because participants completed the scales independently, there was less possibility for social desirability bias—participants that report biased or inaccurate information from direct questioning in order to be viewed more positively and/or appear socially acceptable (Fisher, 1993). Therefore, participants might have been more honest in their reporting on the questionnaires; however, since the findings on the two quantitative scales were for the most part consistent with what the participants reported in the interview, it appears minimal bias occurred.

Secondly, the clinical tools only measured for specific phenomenon—PTSD and PTG. However, participants appeared to experience distress and negative symptoms that were not measured for in the PDS. Conversely, there were some positive effects from the wildfire captured in the qualitative interviews that were not present in the PTGI. Presumably this is because the scope of the quantitative instruments is more limited. However, since the PTGI appears to measure a broader spectrum of variables than the PDS, inconsistencies between the PTGI and the qualitative interviews were not as common. Therefore, it was important to analyze any reasons for discrepancies between

the qualitative and quantitative measures rather than discrediting the findings from the semistructured interviews.

### **Recommendations for Further Research**

Overall, the psychological impacts following a wildfire are poorly understood particularly in Canada's rural areas as well as amongst those who live in the WUI. Moreover, research has not explored the impact that wildfires have on municipal firefighters who normally contend with house fires, not WUI fires. All of these areas need to be researched further simply due to the lack of existing information; the increase in disasters points to the need for further investigations about these issues. The following additional recommended research topics are based on the findings of this study.

The main finding was the role that perception of control played during this wildfire event. More specifically, factors in this study that were linked to participants' perception of control were demographic, dispositional, and behavioural in nature. Demographic aspects such as gender and occupation were precursors to feeling a greater perception of control (i.e., those who were male and who were firefighting personnel). In this study there is a suggested link between demographic factors and perception of control; however due to the smaller sample size, it cannot be definitely determined whether such a relationship exist within the general population. Future research needs to explore this topic.

In addition, a more in-depth study on what factors influence the development of PTG after a wildfire is important in a Canadian context because, due to lack of research, little is known about this topic. Moreover, uncovering ways to influence the emergence of PTG could ameliorate disaster relief services as well as improve individuals' quality of

life after a wildfire. Secondly, it remains unseen whether internal factors need to be present within individuals before they can engage in empowering behaviours such as FireSmart practices. This is important to investigate since these behaviours were linked to increasing perception of control and the development of PTG in this study.

Another potentially fruitful area of investigation would be to explore the finding that some individuals could accept their lack of control during a wildfire; since this was a positive coping method for these participants. The findings presented here revealed that it was more prominent in firefighters within this study—investigating this aspect among a larger group of firefighters as well as with a larger sample of wildfire survivors would extend our knowledge of this topic. Other specific research questions include: Do individuals need to go through distress in order for them to adopt a more adaptive attitude around perception of control, and can government adopt strategies for encouraging this type of perception among community residents? Participants in this study appeared to have had to undergo distress before they could reevaluate and adapt a healthier perception around control and subsequently experience PTG. However, it would be advantageous to determine whether individuals could adopt this attitude without first having to experience trauma and/or distress.

Further, the timeline where psychological distress declines and PTG develops is still unclear and needs to be researched further. The study findings presented here suggested a process whereby psychological distress was still present in some forms, but was mild in comparison to PTG. Potentially fruitful areas of investigation could focus on the following questions: Do these two psychological states function on a continuum, and if so, how does this mechanism occur? Does psychological distress occur strongest at the

onset of the disaster and then overlap with PTG, which increases while distress subsides? Moreover, what is the time that is required for PTG to occur in regards to Canadian wildfire research, and what factors can influence its emergence sooner, or to a larger degree?

On a related note, the findings discussed in this thesis suggest that more research needs to explore the role of the PTG subcategory of spirituality. This area was not found to improve among these participants. An investigation of factors that are related to why PTG was not observed in this area would be important because extending our knowledge about this subcategory has the potential for impacting individual mental health. Questions such as if spirituality is related to individuals possessing preexisting spiritual beliefs before experiencing a wildfire, or, whether spirituality is important for contending with a wildfire, need to be explored further. Subsequently, if the answers to these questions are affirmative, then what factors need to be present in order for spirituality to develop?

Finally, one participant found that looking for meaning throughout the disaster was instrumental in her ability to cope with the distress of the wildfires. Additional research might explore this concept further and investigate whether looking for meaning during a wildfire or other type of disaster would be helpful to a larger wildfire population – especially residents for who appear to experience more distress as a result of wildfires. Further if found to be advantageous, it is important to ascertain ways to foster its emergence.

**Conclusion**

This study aided in increasing the understanding of the lived experiences of community residents and firefighting personnel in Canada, after experiencing a wildfire. The findings appear to be consistent with other disaster and wildfire literature on psychological distress and resilience. Overall, the study's conclusion was that a combination of situational, dispositional, behavioural and demographic factors was linked to individual variations in psychological health and resiliency after the experience of a wildfire. However, the most salient theme related to mental health was perception of control – specifically, increased perception of control was antecedent to higher levels of psychological well-being. Secondly, when external factors were similar, individual variation in distress and resiliency was related to inner traits such as personality traits, the perception of control and sense of efficacy. Since wildfires are increasing in Canada as well as on a global scale, understanding how they affect residents and firefighting personnel from a mental health perspective is important to research, as it can lead to better provision of disaster relief services and increase individual resilience.

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### Appendix A: Study Area

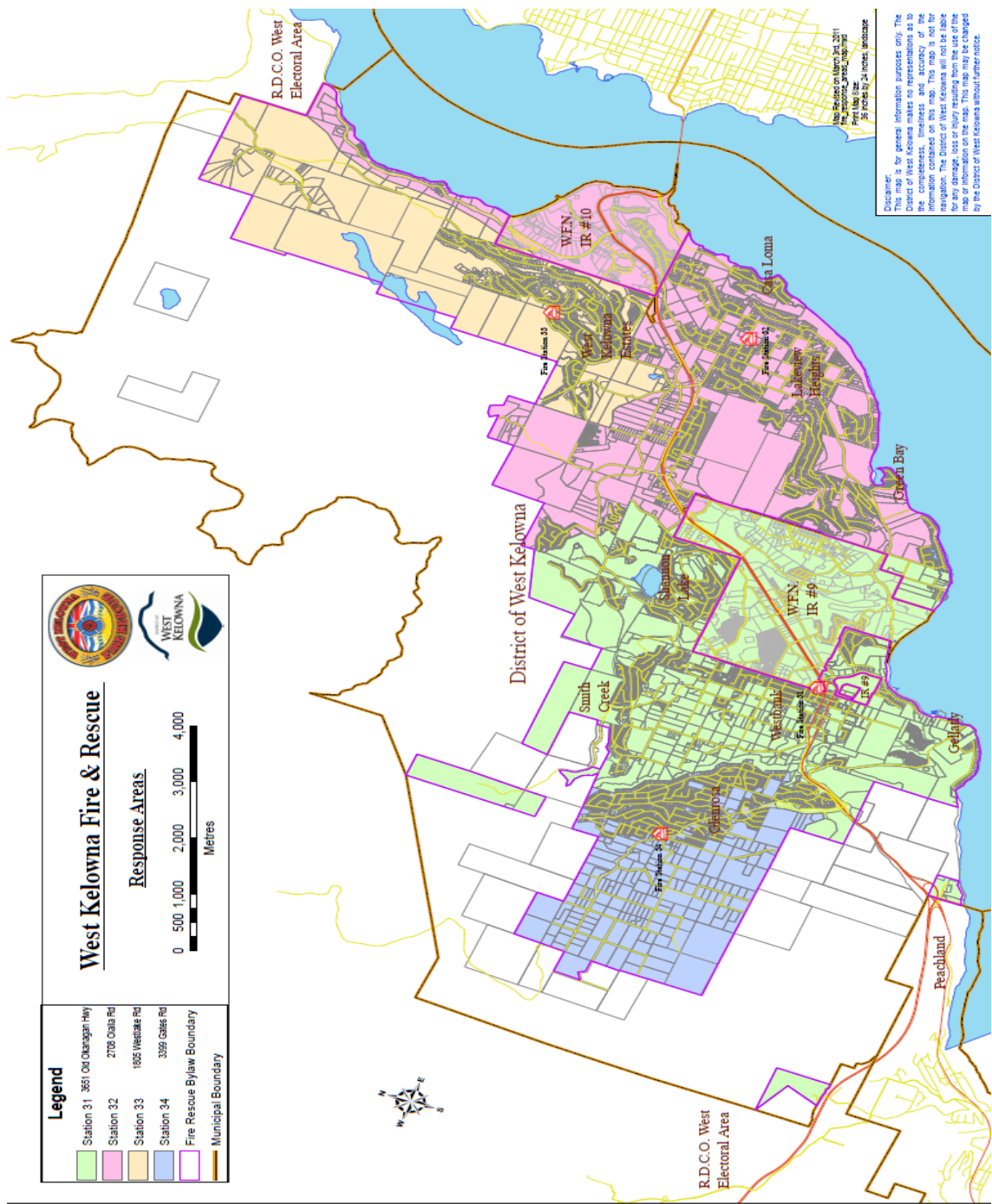


Figure A1. Map of Westside District Municipality.

Note. From Map of District of West Kelowna (p. 1), by District of West Kelowna, 2011, Kelowna, BC, Canada: Author. Copyright 2011 by the District of West Kelowna.

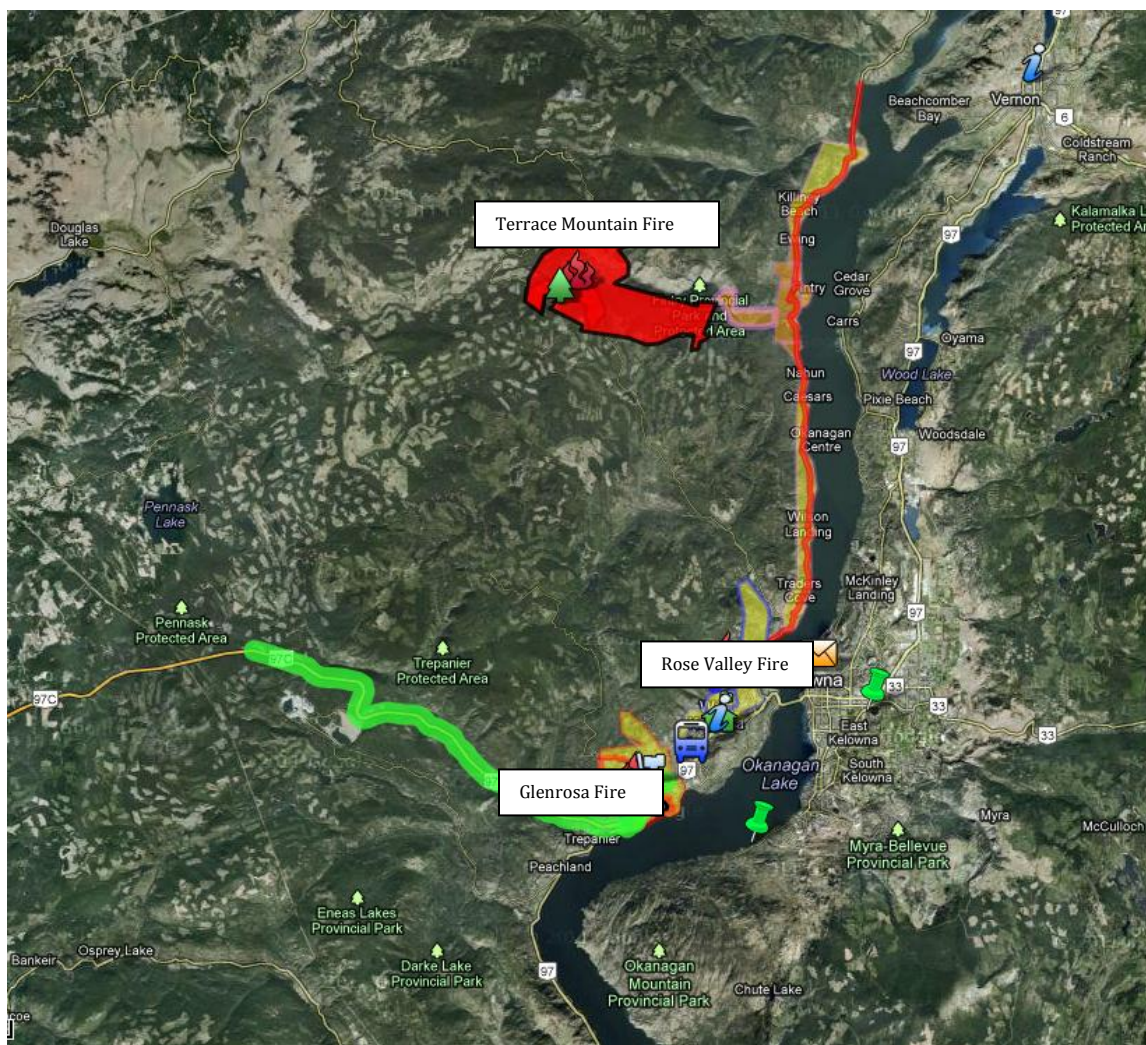
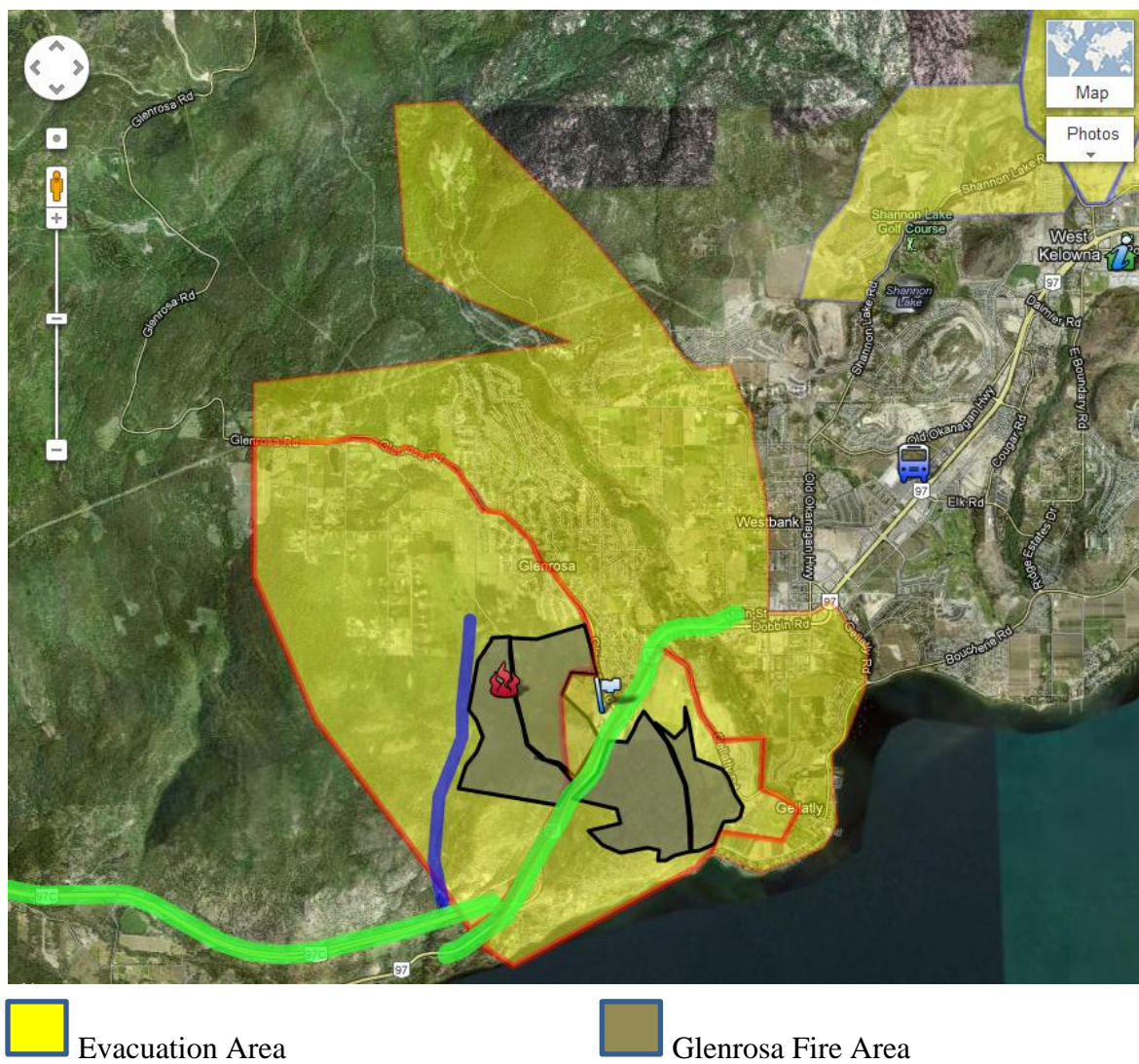


Figure A2. Map of Westside Wildfire locations 2009.

Note. From *West Kelowna Fire Jul 2009 #kelownafire*, by Google Maps, 2009, Retrieved from

<http://maps.google.ca/maps/ms?source=embed&hl=en&geocode=&ie=UTF8&msa=0&msid=110352413985913777176.00046f04cb826a68071fb&ll=49.821816,-119.668922&spn=0.148848,0.281181&t=h>. Copyright 2009 by Google Maps. Reprinted with permission



*Figure A3. Map of Glenrosa fire 2009.*

*Note.* From *Westkelowna Fire Jul 2009 #kelownafire*, by Google Maps, 2009, Retrieved from <http://maps.google.ca/maps/ms?source=embed&hl=en&geocode=&ie=UTF8&msa=0&msid=110352413985913777176.00046f04cb826a68071fb&ll=49.821816,-119.668922&spn=0.148848,0.281181&t=h>. Copyright 2009 by Google Maps. Reprinted with permission.

## **Appendix B: Recruitment Email to Community Stakeholders**

Dear [name of stakeholder],

My name is Ainslee Kimmel and I am a Counselling Psychology Graduate student within the Faculty of Education at the University of Lethbridge. As part of my program, I am required to complete a research project on a topic related to mental health.

My study is about the negative and positive changes experienced after the 2009 West Kelowna wildfires. The purpose of the study is to understand how individuals deal with challenges related to disasters, specifically wildfires. The findings will help us develop a better understanding of how individuals cope after disasters like these. This information can be used in preparing other communities members to deal with challenges and helping local community members and regional, provincial and national decision makers to develop more appropriate mental health strategies for all communities that have to deal with disasters.

I am contacting you because you are a community stakeholder and hold a leadership role within West Kelowna. As such, you may be able to connect me with individuals who have experienced the wildfires in 2009 and have possibly suffered losses (i.e., property loss, unemployment), or may have some unique insights to share regarding coping after the wildfire. If you yourself fit these criteria, I welcome your participation in my study as well.

Your participation in this study will take about 1.5 hours and will be conducted by myself in [date of my trip to community]. It also involves filling out some background information about yourself (gender, age, occupation, etc.).

Please see the included consent form for more details regarding this study.


If you have any questions, please feel free to contact me at [telephone number] or email me at [email address].


Sincerely,

Ainslee Kimmel

## Appendix C: Recruitment Poster

# PARTICIPANTS NEEDED





### FOR STUDY ABOUT THE 2009 WEST KELOWNA WILDFIRES

Graduate student at the University of Lethbridge is seeking participants for a study about any changes experienced after the 2009 West Kelowna Wildfires


We want to learn about how individuals cope after wildfires

The information will be shared with local communities, and regional, provincial and national decision makers to provide guidance about helping individuals and communities who are impacted by wildfires

If you are interested in participating please contact Ainslee Kimmel


Email: [email address]

This Study is Funded By:



Social Sciences and Humanities  
Research Council of Canada

Conseil de recherches en  
sciences humaines du Canada



**Appendix D: Internet Ad**

Seeking Participants for Wildfire Study:

Graduate student from the University of Lethbridge is seeking participants for a study about coping after the 2009 West Kelowna wildfires.

If you are interested in participating please contact Ainslee Kimmel: [telephone number], [email address]

**Appendix E: Newspaper Ad**

Seeking participants for U of Leth study on coping after the '09 W. Kelowna wildfires.  
Contact Ainslee: [phone number] or [email].

*Note:* The wording was abbreviated to reduce cost of ad.

### Appendix F: Demographics Form

<b>Participant ID:</b>	_____		
<b>Date of Birth:</b>	(Month)	(Day)	(Year)
<b>Gender:</b>	Male <input type="checkbox"/>	Female <input type="checkbox"/>	
<b>Relationship Status:</b> (Married, single, common-law, divorced, widowed, separated):	_____		
<b>Ethnicity:</b>	_____		
<b>Education Level:</b> (high school, college diploma, trades certificate, university degree, graduate level or higher):	_____		
<b>Occupational Status:</b> (unemployed, retired, full-time, part-time, seasonal)	_____		
<b>Residential History:</b> (how long have you lived in [name of site])	_____		

### Appendix G: Qualitative Interview for Community Residents

- 1) What has it been like since the disaster? Describe any changes in how people, businesses, or groups interact with one another. (Probe: Are they split into groups, how do people feel about the disaster overall? Are people satisfied with the way the disaster was handled?)
- 2) Describe some of the effects of the fire? (Probes: How did it negatively affect you? Were there any positive outcomes for you? Your family? Other friends or neighbours?)
- 3) How did you personally feel right after the fire? What were some of the reasons for feeling this way? What were some of the symptoms you experienced (mentally, emotionally or physically)?
- 4) How do you think the fire has affected you emotionally over the long term (positively or negatively)? Why do you think it has affected you in this way? (Probes: Have you noticed any personal changes in your moods? Do you feel different emotionally since the fire? If so, how?)
- 5) How do you think the fire has influenced the way you currently think? (probes: Any changes in thoughts about the future? Any changes in attitude? The way you think day-to-day?) If yes, why do you think this change in thinking occurred?
- 6) How do you think the fire has impacted your behaviours? (Probes: Any changes in daily activities? Changes in sleep patterns? Changes in work habits?) If yes, why do you think this is the case?
- 7) Have you noticed any changes in your physical health since the fire? (Probes: any physical symptoms? Any improvements? Any illness/ailments?) If yes, do you think they are related to the experience of the fire?
- 8) How do you think the fire has affected the way you view yourself? (Probes: more positively? More negatively? What specifically?)
- 9) How do you think the fire has affected your relationships? (probe: With family? With friends? With co-workers? Others?). Do you think it has brought you closer together or farther apart? How (examples)?
- 10) What do you think were some lessons learned about the fire? How has the way you view the world changed? How has the way you live your life changed?
- 11) What can be done to improve the health (both mental and physical) of West Kelowna residents who were impacted by the fire?
- 12) Would you consider West Kelowna rural or urban? Explain?

### **Appendix H: Specific Interview Questions for Community Stakeholders**

- 1) What has it been like since the disaster? Describe any changes in how people, businesses, or groups interact with one another. (Probe: Are they split into groups, how do people feel about the disaster overall? Are people satisfied with the way the disaster was handled?)
- 2) What were the positive and negative effects from the fire? (Probes: How did it negatively affect you? How did it positively affect you? Your family? Other friends or neighbours? The community you live in?)
- 3) How did you personally feel right after the fire? What were some of the reasons for feeling this way (positively and negatively)? What were some of the symptoms you experienced (mentally, emotionally or physically)?
- 4) How do you think the fire has affected you over the long-term (emotionally, physically, behaviourally, cognitively)?
- 5) What do you think were some lessons learned about the fire? How has the way you view the world changed? How has the way you live your life changed?
- 6) What would you tell other rural towns or regions based upon this recent wildfire experience? (probe: what advice would you give them about dealing with a wildfire and coping with the difficulties?)
- 7) What can be done to improve the health (both mental and physical) of West Kelowna residents who were impacted by the fire?

### Appendix I: Specific Interview Questions for Firefighting Personnel

- 1) Describe what it was like to fight the 2009 West Kelowna Fires. (Probe: what fire(s) did you help fight? Did you ever feel like your life was in danger? Describe any close calls. How did these affect you emotionally, physically, cognitively?)
- 2) How did you personally feel right after the fire? What were some of the reasons for feeling this way (positively and negatively)? What were some of the symptoms you experienced (mentally, emotionally or physically)?
- 3) What would you tell other rural towns or regions based upon this recent wildfire experience? (probe: what advice would you give them about dealing with a disaster and coping with the difficulties?)  
Do you reside in the West Kelowna or Kelowna area<sup>1</sup>? If yes . . .
- 4) What has it been like since the disaster? Describe any changes in how people, businesses, or groups interact with one another. (Probe: Are they split into groups, how do people feel about the disaster overall? Are people satisfied with the way the disaster was handled?)
- 5) What were the positive and negative effects from the fire? (Probes: How did it negatively affect you? How did it positively affect you? Your family? Other friends or neighbours?)
- 6) How do you think the fire has affected you over the long-term (emotionally, physically, behaviourally, cognitively)?
- 7) What do you think were some lessons learned about the fire? How has the way you view the world changed? How has the way you live your life changed?

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<sup>1</sup> All firefighters interviewed were also West Kelowna residents.

## Appendix J: Posttraumatic Growth Inventory

### TAKING STOCK: Growth Through Resilience

#### The Posttraumatic Growth Inventory

It is strongly recommended that you allow some time to pass from the hardship or tragedy you experienced before you use this inventory. Also keep in mind that it may take time to experience change in the areas addressed by this exercise: relating to others, appreciation of life, new possibilities, spiritual change and personal strength. People often show growth in some areas but not in others, and rarely show growth in all areas at a given time.

### THE POSTTRAUMATIC GROWTH INVENTORY

#### STEP 1: Identify a Life-Altering Event

Focus on one traumatic or life-altering event that has occurred in your life.

##### A. Check the general experience you are thinking of:

- |                                                   |                                                          |
|---------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Loss of a loved one      | <input type="checkbox"/> Financial hardship              |
| <input type="checkbox"/> Chronic or acute illness | <input type="checkbox"/> Career or location change/move  |
| <input type="checkbox"/> Violent or abusive crime | <input type="checkbox"/> Change in family responsibility |
| <input type="checkbox"/> Accident or injury       | <input type="checkbox"/> Divorce                         |
| <input type="checkbox"/> Disaster                 | <input type="checkbox"/> Retirement                      |
| <input type="checkbox"/> Disability               | <input type="checkbox"/> Combat                          |
| <input type="checkbox"/> Job loss                 | <input type="checkbox"/> Other _____                     |

##### B. Indicate time lapsed since event occurred:

- |                                            |                                            |
|--------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> 6 months – 1 year | <input type="checkbox"/> 2 – 5 years       |
| <input type="checkbox"/> 1 – 2 years       | <input type="checkbox"/> More than 5 years |

Information contained in this exercise should not be used as a substitute for professional health and mental health care or consultation.

A licensed mental health professional such as a psychologist can assist people in developing an appropriate strategy for moving forward. It is important to get professional help if you feel like you are unable to function or perform basic activities of daily living as a result of a traumatic or other stressful life experience.

##### Learn more in formation about posttraumatic growth:

A complete report about the development of the PTGI can be found in the article, "The Posttraumatic Growth Inventory: Measuring the Positive Legacy of Trauma" by Richard G. Tedeschi, Ph.D. and Lawrence G. Calhoun, Ph.D. in the *Journal of Traumatic Stress*, July 1996, Volume 9, pages 455-471.

Tedeschi, R.G., Park, C.L., & Calhoun, L.G. (Eds.) (1998). Posttraumatic growth: Positive changes in the aftermath of crisis. Mahwah, New Jersey: Lawrence Erlbaum Associates.

An on-line version of the inventory can be found on: [www.helping.apa.org](http://www.helping.apa.org).

### STEP 2: Answer the Following Questions

Indicate for each of the following statements the degree to which the change reflected in the question is true in your life as a result of your crisis, using the following scale:

- 0= I did not experience this change as a result of my crisis.  
 1= I experienced this change to a very small degree as a result of my crisis.  
 2= I experienced this change to a small degree as a result of my crisis.  
 3= I experienced this change to a moderate degree as a result of my crisis.  
 4= I experienced this change to a great degree as a result of my crisis.  
 5= I experienced this change to a very great degree as a result of my crisis.

1. I changed my priorities about what is important in life. \_\_\_\_\_
2. I have a greater appreciation for the value of my own life. \_\_\_\_\_
3. I developed new interests. \_\_\_\_\_
4. I have a greater feeling of self-reliance. \_\_\_\_\_
5. I have a better understanding of spiritual matters. \_\_\_\_\_
6. I more clearly see that I can count on people in times of trouble. \_\_\_\_\_
7. I established a new path for my life. \_\_\_\_\_
8. I have a greater sense of closeness with others. \_\_\_\_\_
9. I am more willing to express my emotions. \_\_\_\_\_
10. I know better that I can handle difficulties. \_\_\_\_\_
11. I am able to do better things with my life. \_\_\_\_\_
12. I am better able to accept the way things work out. \_\_\_\_\_
13. I can better appreciate each day. \_\_\_\_\_
14. New opportunities are available which wouldn't have been otherwise. \_\_\_\_\_
15. I have more compassion for others. \_\_\_\_\_
16. I put more effort into my relationships. \_\_\_\_\_
17. I am more likely to try to change things which need changing. \_\_\_\_\_
18. I have a stronger religious faith. \_\_\_\_\_
19. I discovered that I'm stronger than I thought I was. \_\_\_\_\_
20. I learned a great deal about how wonderful people are. \_\_\_\_\_
21. I better accept needing others. \_\_\_\_\_

### STEP 3: Total Your Responses

Score each factor by adding your answers from the following questions:

<b>Factor I:</b>	Questions 6, 8, 9, 15, 16, 20, and 21	<b>Total</b> _____
<b>Factor II:</b>	Questions 3, 7, 11, 14, and 17	<b>Total</b> _____
<b>Factor III:</b>	Questions 4, 10, 12, and 19	<b>Total</b> _____
<b>Factor IV:</b>	Questions 5 and 18	<b>Total</b> _____
<b>Factor V:</b>	Questions 1, 2, and 13	<b>Total</b> _____

**STEP 4: Reflect on Your Growth**

If you answered 0 or 1 for many of the questions in any section of the exercise, keep in mind that it may take time to experience change in the areas addressed by this question. Also remember, posttraumatic growth is an ongoing process. Your answers to these same questions may change over time as you change – as you develop and build upon your strengths and adjust to new circumstances. You may want to re-do this exercise, six months or even a year down the road to see how your responses change.

**Factor I: Relating to Others**

**Your Score** \_\_\_\_\_

People who experience trauma typically score approximately 23 within the category of relating to others. If you answered with 4 or 5 to many of the questions in this section, you may be developing even stronger bonds with loved ones, reestablishing relationships with estranged family members and friends, or gaining more compassion for others, especially those who have suffered in similar situations.

**Factor II: New Possibilities**

**Your Score** \_\_\_\_\_

People who experience trauma typically score approximately 18 within the category of new possibilities. If you answered with 4 or 5 to many of the questions in this section you may be noticing that you are beginning to make choices in a more conscious manner according to a plan. You also may be more likely to try to change things that need changing.

**Factor III: Personal Strength**

**Your Score** \_\_\_\_\_

People who experience trauma typically score approximately 15 within the category of personal strength. If you answered with 4 or 5 to many of the questions in this section, you may be expressing greater self-reliance and feeling more able to accept how things turn out and developing personal strength that may help you through such hardships you encounter in the future.

**Factor IV: Spiritual Change**

**Your Score** \_\_\_\_\_

People who experience trauma typically score approximately 5 within the category of spiritual change. If you answered with 4 or 5 to the questions in this section, you may be reevaluating spiritual beliefs, associating with a community of similar believers, or connecting with your spiritual roots.

**Factor V: Appreciation of Life**

**Your Score** \_\_\_\_\_

People who experience trauma typically score approximately 11 within the category of appreciation of life. If you answered with 4 or 5 to many of the questions in this section, you may be developing a greater appreciation of life as a result of your crisis. Some explain this as trying to live each day more fully. Some may rethink their values and priorities about what is important in their life and act differently if they change their priorities – for example, by spending more time with their family.

3

**The Road to Resilience**



*Note.* From *The Posttraumatic Growth Inventory Taking Stock* (pp. 1–3), by R. G. Tedeschi, C. L. Park, & L. G. Calhoun, 1998, Mahwah, NJ: Lawrence Erlbaum Associates. Copyright 1998 by R. G. Tedeschi et al. Reprinted with permission.

## Appendix K: Posttraumatic Stress Diagnostic Scale

# Post-Traumatic Stress Diagnostic Scale (PDS)

### A brief history

The Post-traumatic Stress Diagnostic Scale (PDS) was developed and validated by Edna Foa [1] to provide a brief but reliable self-report measure of post-traumatic stress disorder (PTSD) for use in both clinical and research settings.

### Description

The scale is intended to screen for the presence of PTSD in patients who have identified themselves as victims of a traumatic event or to assess symptom severity and functioning in patients already identified as suffering from PTSD. The test is self-administered and can usually be completed within 10–15 min and requires a reading age of ~13 years. The pencil and paper and computerized scoring versions of the PDS are available from the test distributor [2].

Test items mirror DSM IV criteria for PTSD and items are framed in accessible language. Questions relate to the frequency of distressing and intrusive thoughts, post-traumatic avoidance and hyperarousal.

### Items

The PDS has 49 items. A short checklist identifies potentially traumatizing events experienced by the respondent. Respondents then indicate which of these events has troubled them most in the last month. Respondents then rate their response to this event at the time of its occurrence to determine whether the DSM IV stressor criteria are met (Criterion A1 'the person experienced, witnessed or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others' and Criterion A2, 'the person's response involves intense fear, helplessness, or horror'). Using a four-point scale, respondents then rate 17 items representing the cardinal symptoms of PTSD experienced in the past 30 days. Finally, respondents rate the level of impairment caused by their symptoms across nine areas of life functioning. A diagnosis of PTSD is made only when DSM IV criteria A to F are met. The PDS includes a symptoms severity score which ranges from 0 to 51 and this is obtained by adding up the individual's responses of selected items. The cut offs for symptom severity rating are 0 no rating, 1–10 mild, 11–20 moderate, 21–35 moderate to severe and >36 severe.

### Validity

The PDS has high face validity because items directly reflect the experience of PTSD with high internal consistency (coefficient alpha of 0.92). Test-retest reliability was also highly satisfactory for a diagnosis of PTSD over a 2- to 3-week period ( $\kappa = 0.74$ ). Test-retest using symptoms severity scores yielded a highly significant correlation (0.83). Analysis also revealed an 82% agreement between diagnosis using the PDS and the Structured Clinical Interview for DSM [3].

The PDS does not incorporate any formal scales to detect faking or inconsistent responses. The scale was validated on samples aged 18–65.

### Key research

The PDS has been used in a wide range of clinical and research contexts with a high degree of confidence when use of a structured clinical interview is impractical. PDS has been used in prospective treatment studies helping establish a role for cognitive behavioural therapy in those with established PTSD [4]. Recently, the PDS has been employed in diagnosing PTSD in the emergency services [5].

**Stephen McCarthy**

Lansdowne Clinic, Newcastle upon Tyne, UK  
E-mail: lansdownepsychol@aol.com

### References

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*Note.* From "Post-Traumatic Stress Diagnostic Scale (PDS)," by S. McCarthy, 2008, *Occupational Medicine*, 58, p. 379. Copyright 2008 by S. McCarthy. Reprinted with permission.

## Appendix L: Study Consent Form



### PARTICIPANT (ADULT)-QUALITATIVE CONSENT FORM

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#### Mental Health Perceptions of Rural Community Members and Firefighting Personnel After a Wildfire

You are being invited to participate in a study entitled “Mental Health Perceptions of Rural Community Members and Firefighting Personnel After a Wildfire”, that is being conducted by Ainslee Kimmel. Ainslee Kimmel is a graduate student within the Faculty of Education at the University of Lethbridge and you may contact her if you have further questions at [telephone number], or by email: [email address].

As a graduate student, I am required to conduct research as part of the requirements for a degree in Counselling Psychology within the Faculty of Education. It is being conducted under the supervision of Dr. Judith Kulig RN, DNSc. You may contact my supervisor at [telephone number] or by email: [email address].

In order to conduct this research, I am being funded by a national scholarship from the Social Sciences and Humanities Research Council of Canada (SSHRC). The purpose of this research project is to understand how individuals deal emotionally after experiencing a wildfire. Research of this type is important because the findings will help us develop a better understanding of how individuals cope after wildfires. The results will also help other rural community members to deal with challenges related to wildfires. Finally, this research will help regional, provincial and national decision makers develop more appropriate mental health strategies for all communities that have to deal with wildfires - especially in Canada, since wildfires are increasing.

Someone within the community or myself have contacted you because you have experienced the Terrace Mountain Fire, the Rose Valley Fire, or the Glenrosa Fire in the summer of 2009 and have possibly suffered losses (i.e., property loss, unemployment), or may have some unique insights to share regarding coping after the wildfire. If you agree to voluntarily participate in this research, your participation will include an interview that will take about 1½ hours. I will be asking you a series of questions related to how the wildfire experience has affected your daily activities, plans/goals for the future, views of self, views of the world and your relationships. I will also ask you to complete two short surveys that relate to how you have felt since the wildfire. At the very end, I will ask you some background information related to your age, gender and occupational status. With your consent, I will also be tape recording the interview. The only inconvenience in participating is the time you invest to be interviewed.

There are some potential risks to you by participating in this research. Remembering a past traumatic event can sometimes be upsetting. In efforts to minimize any risks to you,

you may skip questions if you feel uncomfortable answering them, and/or stop the interview at any time. Also please do not hesitate to ask me any questions you might have about the research. If at any time, you experience significant emotional distress, I will provide you with contacts for free and confidential counselling services.

The potential benefits of your participation in this research are that it can help you gain a heightened sense of self-awareness about the progress you have made since the wildfire or how you have grown as an individual. Your information will also help other rural community members to deal with challenges and help regional, provincial and national decision makers to develop more appropriate mental health strategies for all communities that have to deal with disasters - especially in Canada, since wildfires are increasing.

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study and you are not comfortable with me using your data I will destroy it and delete any contact information I have. In terms of protecting your anonymity your real name will not be used on any forms or notes and no one else will be privy to your name except for me. Further, your data will be amalgamated with the other interviewees in order to further protect your identity. I may use individual quotes of particular participants in subsequent publications; however I will not attach names to these quotes.

Your confidentiality and the confidentiality of the data will be protected by keeping all the information in a locked cabinet that is only accessible to me and my supervisor. Planned uses of this data include combining your answers with information from the other study participants to create my final thesis. Data from this study will be disposed of in seven years by destroying all hard copies and deleting computer files relating to the study. The results of this study may be shared with others in a written report and there may be other written material such as presentations and publications about the project. A summary of the findings will be shared with you. The findings may also be shared with a variety of health agencies such as your health region and other interested organizations and disciplines.

In addition to being able to contact the researcher and Dr. Kulig at the above phone numbers, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Chair of the Faculty of Education Human Subjects Research Committee at the University of Lethbridge ([telephone number]).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

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*Name of Participant*

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*Signature*

---

*Date*

***A copy of this consent will be left with you, and a copy will be taken by the researcher.***

## **Appendix M: Counselling Contact List**

### **Free Counselling Services:**

**1) Crisis/Suicide Line | Tel: [Telephone Number]**

Operated by trained volunteers for people of all ages who feel they have a crisis. No diagnosis is given, just support and information about a wide variety of issues.

**2) Suicide Line | Tel: [Telephone Number] (toll-free)**

Province-wide line with trained people available to talk about what you are experiencing. They will get you in contact with emergency mental health services in your area if necessary.

**3) Kelowna Family Centre | Tel: [Telephone Number] | [Address]**

Provides free confidential counselling service for children, youth, parents, seniors and families. There is a referral process for each program. Offers individual and group programs.

**4) Women's Resource Centre | Tel: [Telephone Number] | [Address]**

Drop in centre for women – coffee, resources, advocacy and emotional support.

### **Services With a Possible Fee:**

**1) BC Association of Clinical Counsellors**

Tel: [Telephone Number] | [www.bc-counsellors.org](http://www.bc-counsellors.org)

Regulated Clinical Counsellors dedicated to providing the highest standard of professional counselling, consulting, assessment, testing and training services.

**2) BC Psychological Association | Tel: [Telephone Number]**

[www.psychologists.bc.ca](http://www.psychologists.bc.ca)

Provides province-wide access to Registered Psychologists. BCPA staff will take pertinent information and provide you with conveniently located Registered Psychologists to assist in dealing with your situation.

### Appendix N: Demographic Information for Participants

Participant Pseudonym	Date of Birth	Gender	Relationship Status	Ethnicity	Education Level	Occupational Status	Residential History
Allison	12/23/1949	Female	Married	Caucasian	Graduate Degree	Part-time	22 years
Anne	03/30/1949	Female	Married	Caucasian	High School	Retired	8 years
Greg	07/22/1960	Male	Married	Metis	Certificate	Full-time	14 years
Haley	05/01/1969	Female	Single	Caucasian	Diploma	Unemployed	7 years
Hank	12/18/1948	Male	Married	Caucasian	Diploma	Retired	8 years
Jeff	01/05/1979	Male	Married	Caucasian	Bachelors	Full-time	2 years
Matthew	07/02/1979	Male	Married	Caucasian	Bachelors	Full-time	31 years
Michael	06/18/1950	Male	Married	Caucasian	Bachelors	Full-time	41 years
Sarah	10/22/1950	Female	Married	Caucasian	Graduate Degree	Retired	35 years
Steve	10/17/1973	Male	Married	Caucasian	Bachelors	Full-time	4 years