



Wildfire and COVID-19 in the Sierra Nevada Region of California:

**Small and Medium Sized Business Impacts,
Response, and Recovery**

DECEMBER 2022





Table of Contents

Executive Summary	1
Introduction	2
Methods	3
Results	3
Business Background	
Business Demographics	3
Business Preparedness	3
Wildfire	
Wildfire Impacts	5
Wildfire Response	6
Wildfire Financial or Other Support Received	7
Wildfire Information	8
Public Safety Power Shutoffs (PSPS)	8
Wildfire Recovery	10
COVID-19 Pandemic	
COVID-19 Impacts	10
COVID-19 Response	11
COVID-19 Financial or Other Support Received	12
COVID-19 Information	14
COVID-19 Recovery	15
Compound Events: Wildfire and COVID-19	16
Future Preparedness and Concerns	17
Summary & Discussion	19
Conclusion	21
References	22
Contacts	23
Acknowledgments	23
Appendix A	24
Appendix B	24
Appendix C	25
Appendix D	25

EXECUTIVE SUMMARY

Multiple (or simultaneously occurring) disruptive events can have significant impacts on small and medium sized businesses (SMBs). It is therefore recommended that SMBs plan and prepare for the potential occurrence of multiple disruptive events so that they may more effectively cope with and adapt to them, or more specifically, so that they may become more resilient. However, little is understood about the impacts of multiple disruptive events on SMBs, making it difficult to know how resilience can be achieved. During spring and summer 2020, SMBs in the Sierra Nevada Region of California experienced two major disruptive events: the largest wildfire season in recorded state history and the early stages of the COVID-19 pandemic. Here, we share results from a survey of 202 Sierra Nevada SMBs on the impacts of these events and on SMB planning and preparedness, response and recovery, and learning and change.

The survey was conducted in spring/summer 2021 and is the first phase of a two-part study, the objective of which is to identify the key capabilities and conditions that enable SMB resilience to multiple disruptive events. During the second phase, we will interview a subset of survey respondents to address many of the critical questions about SMB planning and preparedness, response and recovery, and learning and change that have emerged from analysis of the survey results. Key findings from that analysis include:

1. Ninety-eight SMBs reported to have been impacted by wildfire (including direct wildfire, threat of wildfire, and/or wildfire smoke) in 2020, 190 by the COVID-19 pandemic, and 94 by both;
2. The types of impacts from wildfire and the COVID-19 pandemic were varied, but three of the four primary impacts were the same: decreased revenue, decreased demand for services or products, and decreased hours of operation;
3. SMB responses to the impacts of wildfire and the COVID-19 pandemic were varied, but three of the four primary responses were the same: implemented businesses emergency response plan, changed marketing strategies, and decreased the number of services or products offered;
4. One hundred and fifteen SMBs also experienced public safety power shutoffs (PSPS) related to wildfire, with primary impacts being: decreased hours of operation, decreased revenue, and closed to the public;
5. Of the businesses impacted by the COVID-19 pandemic, 160 received one or more types of government financial support, primarily: SBA Paycheck Protection Program (PPP), California Relief Grant, SBA PPP Loan Forgiveness, and county or local government loan or relief programs;
6. Of the businesses impacted by the COVID-19 pandemic, 103 utilized one or more types of personal or nongovernment financial support, primarily: personal liquidity, family/friend loan, or deferred payment on rent or mortgage;
7. Only a small number of SMBs received any kind of financial support related to wildfire, primarily: county or local government loan or relief programs, SBA Economic Injury Disaster Loan, personal liquidity, and family/friend loan;
8. One hundred and thirteen SMBs had prepared for potential disruptive events prior to 2020, primarily by: maintaining data backups (offsite or in the cloud), increasing social media presence to communicate changes to the public, and developing relationships with business support organizations (e.g., Chamber of Commerce);
9. One hundred and fifteen SMBs reported to have been better prepared or in the process of better preparing for potential future disruptive events at the time of the survey;
10. One hundred and ninety-eight SMBs indicated interest in receiving help to increase their preparedness, primarily: access to capital (grants), marketing and branding, and business and cash flow planning.

Following, we provide a more in-depth summary of the survey results and discuss their implications for enhancing the resilience of SMBs. In particular, we emphasize that there may be an important opportunity to increase SMB resilience to wildfire or multiple disruptive events by documenting and sharing lessons learned from 2020 through formal interorganizational learning.



INTRODUCTION

Small and medium sized businesses (SMBs), defined as those businesses with fewer than 500 employees, are vital to the national economy, representing 99.7% of all US businesses and almost half of total private sector employment.^[1] In the western US, wildfires can pose challenges to SMBs through disruption to utilities, services and supply chains, damage to infrastructure and goods, and reductions in short and long-term revenue.^[2-4] These challenges can be long-lasting as individual wildfires often last weeks or months, and SMBs may be affected by multiple fires during the same year.^[5]

During summer and fall 2020, the Sierra Nevada Region of California experienced the largest wildfire season in recorded state history^[6] and the early stages of the COVID-19 pandemic. Multiple (or simultaneously occurring) disruptive events like these have the potential to significantly impact SMBs. They also have the potential to divide managerial attention and resource allocation as SMBs cope with the impacts, sometimes forcing trade-offs that do not always lead to optimal outcomes.^[7] It is often recommended that, to the extent possible, SMBs plan and prepare for the possible occurrence of multiple disruptive events.^[8, 9] Together, planning and preparedness are considered to make up the first of three pillars of business resilience, “anticipation.” The other pillars are “coping” (i.e., response and recovery) and “adaptation” (i.e., learning and change).^[8] However, given that little is understood about the impacts of multiple disruptive events on SMBs, it is difficult to know how they can most effectively plan and prepare for them, cope with them, and adapt to them.^[10] More specifically, it is difficult to know how they can enhance their resilience to them.

Here, we share results from a survey of 202 Sierra Nevada SMBs on the impacts of wildfire (including wildfire, wildfire threat, and wildfire smoke), Public Safety Power Shutoffs (PSPS), and the COVID-19 pandemic, and on SMB planning and preparedness, response and recovery, and learning and change. The survey was conducted in spring/summer 2021 and is the first phase of a two-part study, the objective of which is to identify the key capabilities and conditions that enable SMB resilience to multiple disruptive events. During the second phase, we will interview a subset of survey respondents to address many of the critical questions about SMB planning and preparedness, response and recovery, and learning and change that have emerged from analysis of the survey results. Key findings from that analysis are listed in the executive summary and presented in detail in what follows. In discussing them, we emphasize that there may be an important opportunity to increase SMB resilience to multiple disruptive events by documenting lessons learned from 2020 and facilitating the sharing of those lessons through formal interorganizational learning. Findings from both the survey and the interviews will be shared with participating SMBs as well as business support organizations throughout the Sierra Nevada Region.

METHODS

The survey was conducted in spring/summer 2021 to generate insight into (1) the impacts of wildfire and the COVID-19 pandemic on SMBs in 2020, and (2) the response and recovery of SMBs over the following 12 months. The survey included 46 questions, most of which were “select all that apply” and some of which were written or open response. Given the limitations on in-person interaction in 2020 resulting from the COVID-19 pandemic, the survey was conducted entirely online. Specifically, the survey was developed in Google Forms and distributed via email and electronic newsletter to SMBs throughout the Sierra Nevada by Sierra Business Council (SBC) and partner organizations. Without documentation of the total number of businesses that received the survey, it is not possible to know the overall response rate. Descriptive statistics were used to analyze the survey data.

We acknowledge the limitations of both the electronic surveying and the convenience sampling used here. Electronic surveying can be subject to bias resulting from under-coverage (i.e., when some parts of the research population are not adequately represented in the survey sample) and nonresponse (i.e., when some respondents do not provide answers to all questions asked in the survey).^[11] Further, a convenience sample (i.e., non-randomly selected sample of research participants) cannot be considered representative of an entire population (or in this case, representative of all Sierra Nevada SMBs), precluding the generalizability of results.^[11] However, given the objective and two-part nature of this study, it is less important to know the exact numbers and percentages of businesses that experienced each type of impact and that engaged in each form of preparedness and response. Rather, it is more important simply to identify the types of impacts and forms of preparedness and response as these are the basis for more in-depth inquiry during phase two of the project (i.e., during in-depth interviews with SMBs as described above).^[11] Our intention in conducting the survey has therefore been only to generate a “snapshot” of the types of impacts that Sierra Nevada SMBs experienced from wildfire and the COVID-19 pandemic, and of their forms of preparedness and response.

RESULTS

Business Background

BUSINESS DEMOGRAPHICS

In total, 202 businesses responded to the survey. These businesses represent more than 22 different sectors, listed in Appendix A, most commonly: beauty/personal services (21 business, or 10.4%), retail (20 businesses, or 9.9%), and restaurant/bar (18 businesses, or 8.9%). The 202 businesses are located across twelve Sierra Nevada counties, listed in Appendix B. Most, however, are in Placer (40%) and Nevada (37%) counties, followed by Plumas (7%) and Inyo (7%). Individual respondents were either the owner, manager, or owner/manager of the business. At the time of the survey (spring/summer 2021), 54% of respondents had ten or fewer years of business experience, 22% had 11-20 years, and 24% had more than 20 years (Appendix C). All the businesses can be characterized as small to medium in size (i.e., fewer than 500 employees). The peak employment of businesses prior to the COVID-19 pandemic, in 2019, is shown in Appendix D.

BUSINESS PREPAREDNESS

When asked whether the business had prepared for potential disruptive events prior to 2020, 58% (or 113 of 194 respondents) indicated that they had. Of the 113 businesses that had prepared, 85% (or 96 businesses) had engaged in multiple forms of preparedness while 15% (or 17 businesses) had engaged in one form. The three most common forms of preparedness were: (1) maintained data backups (offsite or in the cloud), (2) increased social media presence to communicate changes to the public, and (3) developed a relationship to business support organizations (e.g., Chamber of Commerce). The different forms of preparedness and numbers and percentages of businesses that engaged in each are listed in Table 1.

Table 1. Forms of business preparedness prior to 2020

FORM OF PREPAREDNESS	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Maintained data backups (offsite or in the cloud)	55	194	28%
N/A, none of the above, not sure/don't know	53	194	27%
Increased social media presence to communicate changes to the public	51	194	26%
Developed a relationship to business support organizations (e.g., Chamber of Commerce)	45	194	23%
Secured one or more generators	44	194	23%
Obtained Personal Protective Equipment (PPE)	42	194	22%
Created or increased defensible space around business property	41	194	21%
Adopted strategies to stay informed of hazard warnings (e.g., downloaded alert app)	40	194	21%
Developed a Business Emergency Preparedness Plan or Checklist (or Business Continuity Plan, Business Resilience Plan, Business Recovery Plan, etc.)	34	194	18%
Checked disaster or other insurance to ensure adequate coverage	29	194	15%
Added or improved A/C or air purification system	28	194	14%
Practiced safety drills (e.g., evacuation)	27	194	14%
Developed a relationship to emergency management organizations	25	194	13%
Invested in technology for remote work by employees	23	194	12%
Increased business liquidity	22	194	11%
Established or increased e-commerce sales capacity	21	194	11%
Maintained offsite hard copies of important documents	21	194	11%
Developed or updated protocol for communicating information to fieldworkers	19	194	10%
Reduced business infrastructure flammability (e.g., protected soffit vents or replaced roof)	13	194	7%
Developed or updated a Telework Plan or Checklist	12	194	6%
Diversified supply chains to minimize vulnerability	12	194	6%
Purchased increased disaster or other insurance	12	194	6%
Secured a secondary storage location	10	194	5%

Businesses were also asked whether they had attended the “Disaster-Proof Your Business” workshops hosted by Valley Vision and SBC in 2018. Only a small number (5) of respondents indicated that they or someone from the business had attended. Of the five respondents, one indicated that the workshops had influenced the preparedness of the business for wildfire, one indicated that the workshops had influenced the preparedness of the business for the COVID-19 pandemic, and three indicated that they were “not sure” or “don’t know” whether the workshops had influenced the preparedness of the business.

Wildfire

WILDFIRE IMPACTS

There were 98 businesses (out of 201 respondents, or 49%) that reported to have experienced one or more types of operational, service/product provision, or financial impacts from wildfire in 2020. Here, “wildfire” refers to wildfire, wildfire threat, and/or wildfire smoke. There was a separate section of the survey dedicated specifically to the identification of impacts on SMBs from PSPS, but it is possible that respondents also considered PSPS when answering questions about wildfire.

When asked to indicate which (if any) of the below (Table 2) impacts they had experienced from wildfire, not all the 98 businesses answered for each type of impact. The number of respondents for each type of impact therefore varies. Nonetheless, the three most common types of impacts were: (1) decreased revenue, (2) disruption to utilities, and (3) decreased demand for services or products.

All but two businesses reported to have experienced more than one type of impact. The numbers and percentages of businesses that experienced these and other impacts from wildfire in 2020 are presented in Table 2. In an average calendar year, just under half of these businesses are impacted by wildfire three or more times, while slightly more than half are impacted fewer than three times.

Table 2. Wildfire impacts on businesses

TYPE OF IMPACT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Decreased revenue	71	93	76%
Disruption to utilities	67	92	73%
Decreased demand for services or products	62	94	66%
Decreased hours of operation	59	94	63%
Disruption to supply chains	47	91	52%
Increased cost of operation	44	88	50%
Increased cost of insurance	37	83	45%
Disruption of product delivery to customers	39	92	42%
Difficulty paying rent or mortgage	37	95	39%
Decreased staff	32	91	35%
Difficulty paying utilities	30	91	33%
Difficulty accessing business (e.g., road closures)	29	90	32%
Difficulty hiring or rehiring employees	25	87	29%
Difficulty making payroll	26	92	28%
Difficulty making business credit card payments	22	93	24%
Difficulty paying other accounts payable	21	90	23%
Damage to or loss of goods	19	89	21%
Closed due to voluntary evacuation	17	90	19%
Difficulty paying taxes	15	88	17%
Closed due to mandatory evacuation	12	90	13%
Decreased cost of operation	7	78	9%
Increased hours of operation	6	85	7%

A small number of the 98 businesses indicated that they had experienced positive impacts from wildfire. Most notably, these impacts included increased demand for services or products and increased revenue. However, the small number of these businesses and the variation in the sectors to which they pertain preclude insight into why they, specifically, experienced positive impacts.

WILDFIRE RESPONSE

Of the 98 businesses that reported to have experienced impacts from wildfire, 97 indicated what (if any) changes the business had made in response. Thirteen percent (or 13 businesses) had made one change while 87% (or 84 businesses) had made multiple changes. The three most common types of change were: (1) implemented a business emergency preparedness plan, (2) decreased or eliminated outdoor service, and (3) changed marketing strategies. The numbers and percentages of businesses that implemented each type of response are presented in Table 3.

Table 3. Business response to wildfire impacts

TYPE OF RESPONSE	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Implemented Business Emergency Preparedness Plan (or Business Continuity Plan, Business Resilience Plan, Business Recovery Plan, etc.)	34	97	35%
Decreased or eliminated outdoor service	32	97	33%
Changed marketing strategies	28	97	29%
Decreased the number of services or products offered	22	97	23%
Transitioned to or increased e-commerce	19	97	20%
None of the above, N/A, not sure/don't know	19	97	20%
Changed the types of services or products offered	17	97	18%
Implemented protocol for communicating emergency information to fieldworkers	15	97	15%
Negotiated longer payment terms with suppliers or service providers	14	97	14%
Other	13	97	13%
Increased or modified business insurance	13	97	13%
Allowed staff (some or all) to work remotely	13	97	13%
Transitioned to increased delivery service	12	97	12%
Increased the number of services or products offered	10	97	10%
Renegotiated terms/payment plans with lenders	8	97	8%
Negotiated lower rent or rent payment deferral	7	97	7%
Collected outstanding payment from customers	4	97	4%
Relocated the office or store	3	97	3%

Of the 13 respondents that indicated they had made “Other” changes in response to the impacts from wildfire in 2020 (Table 3), none specified the type.

FINANCIAL OR OTHER SUPPORT RECEIVED FOR WILDFIRE

Of the 98 businesses that reported to have experienced impacts from wildfire, 96 indicated whether they had received any type of government financial support. There were few businesses (20%, or 19 of 96 respondents) that had received support, six of which had received one type of support and 13 of which had received multiple types. The most common type of support received was from county or local government loan or relief programs. Table 4 lists the types of support and the numbers and percentages of businesses that received them.

Table 4. Types of government support received

TYPE OF GOVERNMENT SUPPORT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
None of the above, N/A, not sure/don't know	77	96	80%
County or local government loan or relief programs	13	96	14%
SBA Economic Injury Disaster Loans (EIDL)	11	96	11%
State government loan or relief programs	9	96	9%
Other federal government loan or relief programs	6	96	6%
SBA Express Bridge Loans	1	96	1%

Additional response options that no respondents selected included SBA Physical Damage Loans and SBA Mitigation Assistance.

There were also few businesses (25%, or 24 of 97 respondents) that reported to have utilized one or more types of personal or nongovernment financial support in response to the impacts of wildfire. Nine had utilized one type of support while 15 had utilized multiple types of support. The most common types of support were personal (as opposed to nongovernment) and included: (1) personal liquidity, (2) loans from family/friends, and (3) business liquidity. The number of businesses that had received a form of nongovernment support were negligible. Table 5 lists the types of personal or nongovernment financial support and the numbers and percentages of businesses that utilized them.

Table 5. Types of personal or nongovernment support utilized

TYPE OF PERSONAL OR NONGOVERNMENT SUPPORT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
None of the above, N/A, not sure/don't know	73	97	75%
Personal liquidity (savings)	11	97	11%
Family/friend loan	11	97	11%
Business liquidity (savings)	10	97	10%
Other	8	97	8%
Deferred payment on previous or existing commercial (bank) loans	4	97	4%
Direct lending/commercial (bank) loans	3	97	3%
Deferred payment on rent or mortgage	3	97	3%
Deferred payment on taxes	3	97	3%
Community foundation financial or other assistance	3	97	3%
Deferred payment on utilities	2	97	2%
Deferred payment on other loans	2	97	2%
Faith-based financial or other assistance	2	97	2%
Fundraising (e.g., crowdfunding)	2	97	2%

Of the eight respondents that indicated they had utilized “Other” types of personal or nongovernment financial support (Table 5), none specified the source. An additional option that no respondents selected was business interruption or other insurance.

WILDFIRE INFORMATION

Businesses were asked what sources they trust for information related to wildfire, including about health/safety and business/financial assistance. Most (94%, or 89 of 95 respondents) indicated that they trust more than one source. For the majority (69%, or 66 of 95 respondents), this included county or local government (e.g., websites) followed by local network TV news and state government (e.g., websites). Table 6 lists the types of information sources and numbers and percentages of businesses that reported to trust them.

Table 6. Trusted sources of wildfire information

INFORMATION SOURCE	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
County or local government (e.g., websites)	66	95	69%
Local network TV news	42	95	44%
State government (e.g., websites)	37	95	39%
Internet sources	35	95	37%
National Weather Service	34	95	36%
Social media	32	95	34%
Radio	28	95	29%
Colleagues, family, or friends	23	95	24%
Federal government (e.g., websites)	21	95	22%
Business support organizations (e.g., Chamber of Commerce)	21	95	22%
Community-based, faith-based, or other nongovernment organizations	16	95	17%
Other businesses	15	95	16%
AirNow.gov	14	95	15%
Community leaders	13	95	14%
National network TV news	12	95	13%
Print newspaper	11	95	12%
Other	7	95	7%
None of the above, not sure/don't know	1	95	1%

Of the seven respondents that indicated they trust “Other” sources of wildfire information (Table 6), only a few specified them. Those sources included CalFire, YubaNet, and Nixle.

PUBLIC SAFETY POWER SHUTOFFS (PSPS)

Businesses were also asked whether they had experienced one or more PSPS related to wildfire in 2020. Of the total 202 businesses that responded to the survey, 46% (or 93 businesses) indicated that they had experienced PSPS multiple times, 11% (or 22 businesses) indicated one time, 36% (or 72 businesses) indicated no times, and 7% (or 15 businesses) answered N/A or not sure/don't know (Table 7).

Table 7. Frequency of PSPS experienced

FREQUENCY OF PSPS EXPERIENCED	# OF BUSINESSES	% OF TOTAL
Multiple times	93	46%
None	72	36%
One time	22	11%
N/A, not sure/don't know	15	7%
Total	202	100%

Of the total 115 businesses that reported to have experienced one or more PSPS in 2020, 76% (or 87 businesses) indicated that the PSPS had resulted in more than one impact. The most common impacts were: (1) decreased hours of operation, (2) decreased revenue, and (3) closed to the public. Table 8 lists the numbers and percentages of businesses that experienced these and other impacts from PSPS.

Table 8. Impacts of PSPS to businesses

TYPE OF IMPACT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Decreased hours of operation	62	115	54%
Decreased revenue	58	115	50%
Closed to the public	49	115	43%
Disruption of product delivery to customers	35	115	30%
Increased cost of operation	29	115	25%
Disruption of supply chains	25	115	22%
Decreased demand for services or products	25	115	22%
Decrease in staff	25	115	22%
Damage to or loss of retail/wholesale goods	13	115	11%
None of the above, N/A, not sure/don't know	8	115	7%
Damage to or loss of property/infrastructure	6	115	5%
Other	4	115	3%



Of the four respondents that indicated they had experienced “Other” impacts from PSPS in 2020 (Table 8), three specified the purchase or use of generators and solar panels, and one specified the loss of communication capabilities.

A negligible number of businesses also reported to have experienced positive impacts from PSPS in 2020, most notably increased demand for services or products. However, the small number of these businesses and the variation in the sectors to which they pertain preclude insight into why they, specifically, experienced positive impacts.

WILDFIRE RECOVERY

Businesses were asked whether they had recovered from the impacts of wildfire at the time of the survey (spring/summer 2021). Of the 90 businesses that responded, 57% (or 51 businesses) reported to be fully recovered, 19% (or 17 businesses) reported to be partially recovered, 14% (or 13 businesses) reported not to be recovered, and 10% (or 9 businesses) answered “not sure/don’t know” (Table 9).

Table 9. Business recovery from wildfire

DEGREE OF RECOVERY	# OF BUSINESSES	% OF TOTAL
Fully recovered	51	57%
Partially recovered	17	19%
Not recovered	13	14%
Not sure/don't know	9	10%
Total	90	100%

Respondents were given the opportunity to elaborate on why they were partially recovered or not recovered from the impacts of wildfire. However, the number of responses were too few to meaningfully analyze.

COVID-19 Pandemic

COVID-19 IMPACTS

There were 190 out of the total 202 businesses (or 94%) that reported to have experienced one or more types of operational, service/product provision, or financial impacts from the COVID-19 pandemic in 2020. When asked to indicate which (if any) of the following (Table 10) impacts they had experienced, not all the 190 businesses answered for each type of impact. The number of respondents for each type of impact therefore varies.

Nearly all the 190 businesses reported to have experienced more than one type of impact. The most common impact was decreased revenue, followed by decreased hours of operation, and decreased demand for services or products (Table 10). The numbers and percentages of businesses that experienced these and other impacts from the COVID-19 pandemic in 2020 are presented in Table 10.



Table 10. Business impacts from COVID-19

TYPE OF IMPACT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Decreased revenue	162	182	89%
Decreased hours of operation	133	169	79%
Decreased demand for services or products	134	173	77%
Increased cost of operation	125	170	74%
Closed to the public due to mandate	129	176	73%
Disruption to supply chains	115	166	69%
Difficulty paying rent or mortgage	117	179	65%
Decreased staff	104	167	62%
Difficulty hiring/rehiring employees	97	162	60%
Disruption of product delivery to customers	94	158	59%
Difficulty making payroll	99	174	57%
Difficulty paying utilities	92	173	53%
Difficulty paying other accounts payable	83	168	49%
Closed to public voluntarily	74	160	46%
Difficulty paying taxes	74	168	44%
Difficulty making business credit card payments	69	169	41%
Increased cost of insurance	55	140	39%
Increased demand for services or products	51	155	33%
Decreased cost of operation	26	148	18%
Increased hours of operation	16	147	11%
Increased staff	14	141	10%
Decreased cost of insurance	10	138	7%



A small number of businesses also reported to have experienced positive impacts from the COVID-19 pandemic in 2020, most notably, increased demand for services or products and increased revenue. However, the small number of businesses and variation in sectors to which they pertain preclude insight into why they, specifically, experienced positive impacts.

COVID-19 RESPONSE

Of the 190 businesses that reported to have experienced impacts from the COVID-19 pandemic, 187 indicated what (if any) changes they had made in response. Five percent (or ten businesses) made one change while 95% (or 177 businesses) made multiple changes. The three most common changes were: (1) changed the number of customers served at a time (e.g., fewer people allowed in store), (2) changed marketing strategies, and (3) decreased the number of services or products offered. The numbers and percentages of businesses that implemented each type of change are presented in Table 11.

Table 11. Business response to COVID-19 impacts

TYPE OF CHANGE	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Changed the number of customers served at a time (e.g., fewer people allowed in store)	95	187	51%
Changed marketing strategies	94	187	50%
Decreased the number of services or products offered	68	187	36%
Implemented Businesses Emergency Preparedness Plan (or Business Continuity Plan, Business Resilience Plan, Business Recovery Plan, etc.)	65	187	35%
Changed the types of services or products offered	65	187	35%
Transitioned to or increased outdoor service	58	187	31%
Transitioned to or increased e-commerce	54	187	29%
Transitioned to or increased contactless pick-up	52	187	28%
Created new roles for staff to keep them busy/retain them	48	187	26%
Negotiated lower rent or rent payment deferral	41	187	22%
Allowed staff (some or all) to work remotely	39	187	21%
Transitioned to or increased delivery service	37	187	20%
Negotiated longer payment terms with suppliers or service providers	35	187	19%
Implemented protocol for communicating emergency information to fieldworkers	31	187	17%
Increased or modified insurance coverage	26	187	14%
Increased the number of services or products offered	22	187	12%
Renegotiated current or future prices with suppliers	20	187	11%
Collected outstanding payments from customers	19	187	10%
None of the above, N/A, not sure/don't know	13	187	7%
Relocated office or store	9	187	5%
Other	8	187	4%

Eight respondents indicated they had made “Other” changes in response to the impacts of the COVID-19 pandemic in 2020 (Table 11). These changes included: ceased all work travel, closed the physical business location, laid off staff, acquired an additional job, implemented COVID-19 screening and cleaning procedures, increased prices, or transitioned the business entirely (i.e., from Airbnb to residential rental).

FINANCIAL OR OTHER SUPPORT RECEIVED FOR COVID-19

Of the 190 businesses that reported to have experienced impacts from the COVID-19 pandemic, 188 indicated whether they had received any type of government financial support. Most of the businesses (85%, or 160 of 188 respondents) had received support, 36 of which had received one type and 124 of which had received multiple types. The most common types of support were SBA Paycheck Protection Program (PPP) Loan Round I, California Relief Grant, and SBA PPP loan forgiveness. Table 12 lists the types of support and the numbers and percentages of businesses that received them.

Table 12. Types of government support received

TYPE OF GOVERNMENT SUPPORT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
SBA Paycheck Protection Program (PPP) loan ROUND 1	95	188	51%
California Relief Grant	77	188	41%
SBA Paycheck Protection Program (PPP) loan forgiveness	77	188	41%
County or local government loan or relief programs	75	188	40%
SBA Paycheck Protection Program (PPP) loan ROUND 2	72	188	38%
SBA Economic Injury Disaster Loan (EIDL)	65	188	35%
SBA Economic Injury Disaster Loan (EIDL) Emergency Advance	30	188	16%
None of the above, N/A, not sure/don't know	28	188	15%
Other federal government loan or relief programs	19	188	10%
Other state government loan or relief programs	9	188	5%
SBA Debt Relief	9	188	5%
Other	5	188	3%
SBA Express Bridge Loans	2	188	1%
USDA loan or relief programs	2	188	1%

Of the five respondents that indicated they had received “Other” types of government support (Table 12), four specified unemployment insurance and one specified mortgage forbearance.

Additionally, 56% (or 103 of 184 businesses) reported to have utilized one or more types of personal or nongovernment financial support in response to the impacts of the COVID-19 pandemic. Forty-four had utilized one type of support while 59 had utilized multiple types of support. The three most common types of support were (1) personal liquidity, (2) loans from family/friends, and (3) deferred payment on rent or mortgage. Table 13 lists the types of personal or nongovernment financial support and the numbers and percentages of businesses that utilized them.

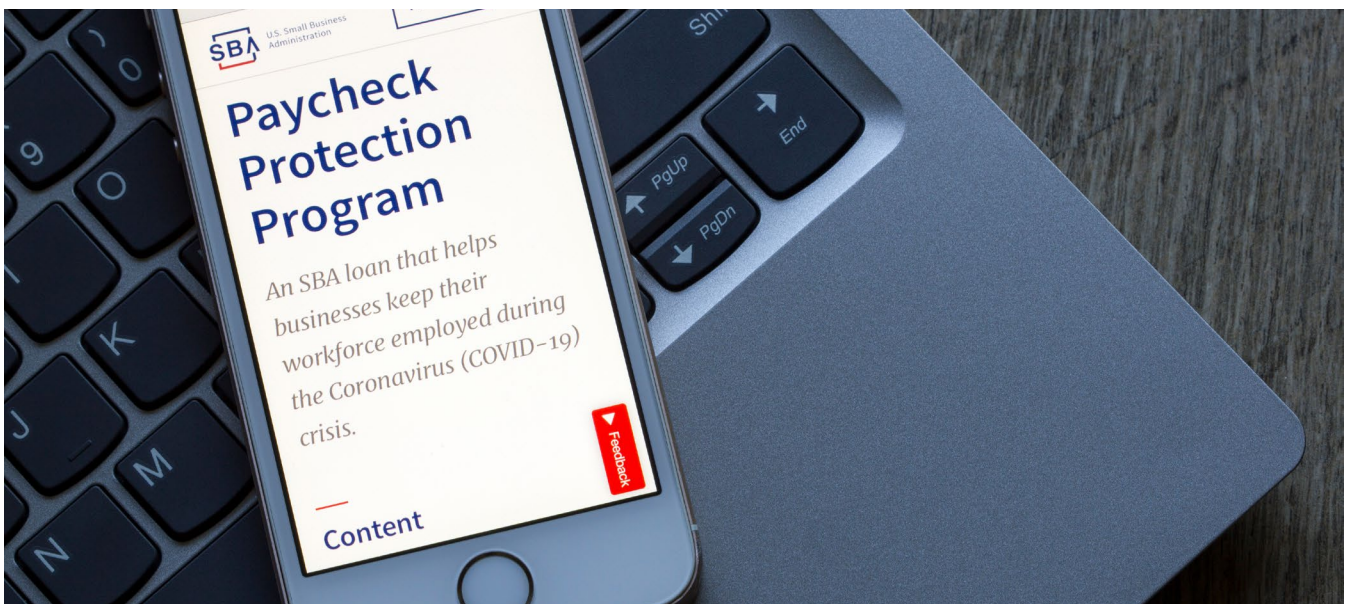


Table 13. Types of personal or nongovernment support utilized

TYPES OF PERSONAL OR NONGOVERNMENT SUPPORT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
None of the above, N/A, not sure/don't know	79	184	43%
Personal liquidity (savings)	44	184	24%
Friend/family loan	32	184	17%
Deferred payment on rent or mortgage	30	184	16%
Business liquidity (savings)	24	184	13%
Deferred payment on other loans	16	184	9%
Deferred payment on utilities	14	184	8%
Deferred payment on taxes	14	184	8%
Community foundation financial or other assistance	12	184	7%
Direct lending/commercial (bank) loans	12	184	7%
Deferred payment on previous or existing commercial (bank) loans	11	184	6%
Fundraising (e.g., crowdfunding)	7	184	4%
Business interruption (or other) insurance	5	184	3%
Other	4	184	2%
Faith-based organization financial or other assistance	2	184	1%

Of the four respondents that indicated they had utilized “Other” types of personal or nongovernment financial support (Table 13), three specified the source, including: a Chamber of Commerce grant, funds gifted from clients in a show of support, and a no-interest credit card loan.

COVID-19 INFORMATION

Businesses were asked what sources they trust for information related to the COVID-19 pandemic. Most (82%, or 151 of 185 respondents) indicated that they trust more than one source. The most trusted source was county or local government (e.g., websites), followed by state and federal governments (e.g., websites). Table 14 shows the types of information sources and numbers and percentages of businesses that reported to trust them.



Table 14. Trusted sources of COVID-19 information

INFORMATION SOURCE	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
County or local government (e.g., websites)	119	189	63%
State government (e.g., websites)	90	189	48%
Federal government (e.g., websites)	76	189	40%
National network TV news	63	189	33%
Internet sources	63	189	33%
Local network TV news	62	189	33%
Small Business Development Center (SBDC) business counseling or COVID-19 resources	52	189	28%
Colleagues, friends, or family	47	189	25%
Business support organizations (e.g., Chamber of Commerce)	44	189	23%
Social media	27	189	14%
Other businesses	27	189	14%
Radio	26	189	14%
Community leaders	26	189	14%
Print newspaper	26	189	14%
None of the above, N/A, not sure/don't know	25	189	13%
Community-based, faith-based, or other nongovernment organizations	13	189	7%
Other	4	189	2%

Of the four respondents that indicated they also trust “Other” sources (Table 14), two specified research and science, one specified the California Restaurant Association and National Restaurant Association, and one specified doctors and nurses.

COVID-19 RECOVERY

Businesses were asked whether they had recovered from the impacts of the COVID-19 pandemic at the time of the survey (spring/summer 2021). Of the 189 businesses that responded, 43% (or 82 businesses) reported not to be recovered, 32% (or 60 businesses) reported to be partially recovered, 14% (or 26 businesses) reported to be fully recovered, 6% (or 11 businesses) reported “Other,” and 5% (or 10 businesses) reported not sure/don't know (Table 15).

Table 15. Business recovery from COVID-19 impacts

DEGREE OF RECOVERY	# OF BUSINESSES	% OF TOTAL
Not recovered	82	43%
Partially recovered	60	32%
Fully recovered	26	14%
Other	11	6%
Not sure/don't know	10	5%
Total	189	100%

The eleven respondents who indicated “Other” were either not recovered or partially recovered but did not specify which.

Some businesses chose to provide explanation for why they were partially recovered or not recovered from the impacts of the COVID-19 pandemic. The most common reasons were decreased revenue or inability to recuperate financial losses, loss of clients and customers, difficulty hiring or rehiring employees (e.g., resulting in reduced hours of operation), loan repayment, and supply chain issues. Many of the businesses that reported to be partially recovered noted that recovery was happening very slowly.

COMPOUND EVENTS: WILDFIRE AND COVID-19

Of the 98 businesses that reported to have experienced operational, service/product provision, or financial impacts from wildfire in 2020, 94 (or 96%) reported they had also experienced impacts from the COVID-19 pandemic. Further, for 28 (or 29%) of those businesses, impacts from the COVID-19 pandemic had made it difficult for them to respond to the impacts of wildfire. Table 16 lists the numbers and percentages of businesses that experienced the same impacts from both wildfire and the COVID-19 pandemic. Though not displayed in the Table, it is notable that 64 (or 65%) of these businesses also experienced impacts from PSPS.

Table 16. Business impacts from both wildfire and COVID-19

TYPE OF IMPACT	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Decreased revenue	65	88	74%
Decreased demand for services or products	50	88	57%
Decreased hours of operation	43	85	51%
Disruption of supply chains	40	89	45%
Increased cost of operation	36	85	42%
Difficulty paying rent or mortgage	36	93	39%
Disruption of product delivery to customers	28	86	33%
Decreased staff	26	83	31%
Difficulty paying utilities	26	89	29%
Difficulty hiring/rehiring employees	24	84	29%
Difficulty making payroll	23	90	26%
Increased cost of insurance	20	76	26%
Difficulty making business credit card payments	20	91	22%
Difficulty paying other accounts payable	19	89	21%
Difficulty paying taxes	13	86	15%
Closed to the public due to mandate	10	86	12%
Closed to the public voluntarily	10	84	12%

A negligible number of businesses also reported to have experienced positive impacts from both wildfire and the COVID-19 pandemic in 2020. These impacts primarily included increased demand for services or products and increased revenue. However, the small number of these businesses and the variation in the sectors to which they pertain preclude insight into why they, specifically, experienced positive impacts.

FUTURE PREPAREDNESS AND CONCERNS

Businesses were asked whether the impacts of wildfire or the COVID-19 pandemic had influenced their preparedness for potential future disruptive events. Of the total 202 respondents, 36% (72 businesses) indicated that, at the time of the survey (spring/summer 2021), the business was better prepared for future disruptive events (Table 17). Another 20% (or 40 businesses) indicated that they were not better prepared, and 15% (or 31 businesses) indicated that they were in the process of better preparing (Table 17).

Table 17. Business preparedness for potential future disruptive events

LEVEL OF PREPAREDNESS	# OF BUSINESSES	% OF TOTAL
Better prepared	72	36%
N/A, not sure/don't know	42	21%
Not better prepared	40	20%
In the process of preparing	31	15%
Both better prepared and in the process of preparing	12	6%
Other	5	2%
Total	202	100%

All four of the respondents that indicated “Other” (Table 17) explained that they do not believe their businesses can prepare for disruptive events.

When asked what (if any) types of assistance would help in preparing for potential future disruptive events, 198 businesses responded. Of those 198 businesses, 51% (or 100 businesses) indicated access to capital in the form of grants (Table 18), followed by much smaller percentages of businesses interested in other types of assistance. The types of assistance and numbers and percentages of business interested in them are listed in Table 18.



Table 18. Assistance types of interest

TYPE OF ASSISTANCE	# OF BUSINESSES	# OF RESPONDENTS	% OF TOTAL
Access to capital (grants)	100	198	51%
Marketing and branding	57	198	29%
Business planning	54	198	27%
Cash flow planning	53	198	27%
Workforce and hiring	44	198	22%
None of the above, not sure/don't know	39	198	20%
Website development	39	198	20%
Insurance coverage	36	198	18%
Bookkeeping and accounting	36	198	18%
Access to capital (loans)	36	198	18%
Succession planning	34	198	17%
E-commerce	32	198	16%
Tax assistance	32	198	16%
Help buying or selling a business (including to employees)	28	198	14%
Business expansion	26	198	13%
Legal assistance	23	198	12%
Other	11	198	6%
Relocation assistance	11	198	6%

Of the 11 respondents that indicated interest in “Other” types of assistance (Table 18), four specified help maintaining power during PSPS, two specified fewer disruptions, and one specified each of the following: lower taxes and insurance, more coordination between government agencies, stronger government leadership, more government advocacy from business groups for business protection, and how to lease a business to employees.

In an open-ended question, respondents were asked what (if any) concerns they had about the potential for future disruptive events to impact the business. Of the 107 businesses that responded, 24 (or 22%) expressed concern about future wildfire, primarily in terms of its potential to impact the business physically, operationally, or financially, and in terms of its potential to prompt PSPS. They also expressed concern about future wildfire resulting in increased insurance and long-term damage to certain industries (e.g., outdoor recreation) and the communities that rely on them. Another 13 (or 12%) expressed concern about the continued duration of the COVID-19 pandemic and the potential for future pandemics resulting in further mandatory shutdowns. There were also 12 (or 11%) that expressed concern about the occurrence both of future wildfires (namely, PSPS) and of future pandemics (namely, shutdowns). Smaller numbers of businesses expressed concern about the potential economic impacts of any type of future disruptive event (12 businesses, or 11%), the role of government in future disruptive events (e.g., mandating shutdowns) (11 businesses, or 10%), the ease of accessing timely, accurate information about wildfire and the COVID-19 pandemic (5 businesses, or 5%), and the “unknown” (3 businesses, or 3%). An additional 27 businesses (or 25%) expressed unique concerns that are not listed here as they were not generalizable.

Summary & Discussion

Again, not all the 202 Sierra Nevada SMBs that responded to the survey chose to answer every question. However, there were 98 businesses that indicated they had been impacted by wildfire, 115 by PSPS, and 190 by the COVID-19 pandemic. Of the 98 businesses that had been impacted by wildfire, 94 (or 96%) had also been impacted by the COVID-19 pandemic, and 64 (or 65%) had been impacted by both the COVID-19 pandemic and PSPS. The order of impacts each from wildfire and the COVID-19 pandemic were varied. However, three of the four primary impacts were the same: (1) decreased revenue, (2) decreased demand for services or products, and (3) decreased hours of operation (Tables 2 and 10). These were also the three primary impacts for the 94 businesses that had experienced both wildfire and the COVID-19 pandemic (Table 16). Two of the impacts – decreased revenue and decreased hours of operation – were also among the four primary impacts businesses reported to have experienced from PSPS (Table 8).

The similarity in primary impacts across disruptive events – wildfire, the COVID-19 pandemic, and PSPS – is perhaps not surprising as each of these events has the potential to temporarily shutter businesses or interrupt demand. In fact, in several of the open, written-response survey questions, respondents used the term “shutdowns” to refer not only to temporary closures resulting from the COVID-19 pandemic but also from PSPS. However, other impacts should not be overlooked. They varied in order by type of disruptive event but in many instances either contributed to or resulted from the primary impacts highlighted above. This interconnectedness of impacts suggests that they may best be understood holistically.

It is not known from this survey whether, how, and the degree to which government, personal, or nongovernment financial support may have offset decreased revenue (or other impacts) or otherwise assisted businesses in their response and recovery. However, 85% (or 160 of 188 businesses) had received one or more types of government support related to the COVID-19 pandemic and 56% (or 103 of 184 businesses) had utilized one or more types of personal or nongovernment support (Tables 12 and 13). Only a small number of businesses had received any kind of financial support related to wildfire. It is difficult to compare these results with those of other surveys on financial support received during the COVID-19 pandemic due to variation in the questions asked across surveys.^[12] Further, to our knowledge, there have not been other surveys that inquire about the impacts of wildfire or PSPS on SMBs, or about the compound impacts of wildfire and the COVID-19 pandemic.

The responses of SMBs to the impacts of wildfire and the COVID-19 pandemic were also varied. However, in both cases, three of the four primary responses were the same: (1) implemented businesses emergency response plan, (2) changed marketing strategies, and (3) decreased the number of services or products offered (Tables 3 and 11). It is notable that 58% of businesses (or 113 of 194 respondents) indicated they had prepared for potential disruptive events prior to 2020, with most (96 businesses) having engaged in multiple forms of preparedness. Yet, most were still impacted.

To be sure, research has shown that there is not always a significant association between prior preparedness and businesses response and recovery.^[13] For example, the size of a disruptive event can be larger than anticipated,^[14] or the type of event can be novel and the number and scope of impacts unforeseen.^[15] The COVID-19 pandemic has been characterized as exceptional in all three aspects (i.e., size, novelty, and scope).^[15] Further, it is not well known whether planning for one type of disruptive event significantly influences preparedness for others.^[10, 16] The prior preparedness of respondents in this survey therefore raises important questions about whether, how, and to what degree it may have attenuated the impacts of wildfire or the COVID-19 pandemic. It also raises questions about what new

Summary & Discussion

or additional forms of preparedness are needed to reduce SMB vulnerabilities and increase their resilience to these and other potential future disruptive events. Access to capital in the form of grants was the type of assistance in which businesses expressed greatest interest in helping to increase their preparedness (Table 18). Another question is how or to what forms of preparedness those grants would (or could most effectively) be applied.

It is also notable that 72 of the total 202 respondents (or 36%) indicated that, at the time of the survey (spring/summer 2021), the business was better prepared for potential future disruptive events, while another 31 businesses (or 15%) reported to be in the process of better preparing (Table 17). Together, these businesses represent slightly more than half (51%) of the total respondents. This suggests that learning, and perhaps innovation, are being implemented within some businesses while challenges may exist for others. Certainly, learning and innovation are not uncommon during and immediately following a disruptive event,^[17] and both are considered hallmarks of business resilience.^[8, 18] Given the likelihood that wildfire and related PSPS will occur in the future,^[19] as might other potential disruptive events, documenting and sharing the learning and innovation that have taken place could be highly instructive for individual businesses or business sectors.

This interorganizational (or inter-business) learning may already be taking place informally (e.g., through existing business relationships) but could also be facilitated to take place formally (e.g., through workshops conducted by professional institutions, business support organizations, trade associations, sector-based research organizations, “best-practice” clubs, “clusters,” local learning cooperatives, regional development agencies, and practitioner networks).^[20] Both are encouraged as complementary,^[21] but the latter may be especially important for ensuring information equity. Historically underrepresented businesses tend to be more vulnerable to disruptive events,^[10] and information inequity could perpetuate or deepen preexisting disparities among SMBs.

The numerous concerns respondents expressed related to wildfire, PSPS, the COVID-19 pandemic, and other potential future disruptive events suggest that many businesses may be open to and interested in interorganizational learning. Certainly, there is evidence to support the value of this learning in enhancing business preparedness for hazards specifically,^[22] and for increasing innovation and competitiveness generally.^[23] Given that county and local governments were the most trusted sources of information related to both wildfire and the COVID-19 pandemic, there may be an important role for them to play as hosts (e.g., on websites) of information generated through documented, formal interorganizational learning. This information could be further disseminated through other of the varied trusted sources identified (Tables 6 and 14).

Lastly, the sharing of information related to wildfire and PSPS preparedness, response, and recovery may be particularly valuable for Sierra Nevada SMBs. The recurrence of wildfire impacts on Sierra Nevada SMBs is likely,^[19] and the types of government and nongovernment financial support related to wildfire are far fewer in comparison to those related to the COVID-19 pandemic. Prioritizing the identification and sharing of how businesses have better prepared or are in the process of better preparing for future wildfire and PSPS impacts specifically, or for the occurrence of multiple events generally, may therefore be of more immediate importance especially in the absence of that support.

Conclusion

We conducted a survey of 202 SMBs in the Sierra Nevada Region of California to create a snapshot of the impacts of wildfire, PSPS, and the COVID-19 pandemic in 2020, and on business planning and preparedness, response and recovery, and learning and change. A key finding is that roughly half of SMBs had planned and prepared for disruptive events prior to 2020, yet many were still impacted by wildfire and nearly all were impacted by the COVID-19 pandemic. This is perhaps not surprising as both the magnitude and duration of these events in 2020 were considerable, and the COVID-19 pandemic was also novel. The increased preparedness of more than half of SMBs one year later suggests that learning and change have taken place that may offer key insights for increasing SMB resilience to multiple disruptive events. The recurrence of wildfire impacts on Sierra Nevada SMBs is likely, and there is also potential for the occurrence of multiple disruptive events in the future. Given the importance of SMBs to individual livelihoods and families and to local and broader economies, there may be great value in documenting and sharing that learning in the interest of increasing the resilience of all.



Conclusion

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Contacts

Kristin VanderMolen – Kristin.VanderMolen@dri.edu
Tamara Wall – Tamara.Wall@dri.edu
Sierra Business Council – info@sierrabusiness.org; 530-582-4800

Acknowledgments

We offer our sincere thanks to the 202 businesses that volunteered their time to take part in this survey. This Project was supported by the California Nevada Adaptation Program (CNAP), a NOAA Regional Integrated Sciences and Assessments team.

Table A. Types of businesses

TYPE OF BUSINESS	# OF BUSINESSES	% OF TOTAL
Other	31	15.3%
Beauty/personal services	21	10.4%
Retail	20	9.9%
Restaurant/bar	18	8.9%
Hospitality	16	7.9%
Medical/dental services	13	6.4%
Arts/entertainment	10	4.9%
Childcare	9	4.5%
Nonprofit organization	9	4.5%
Manufacturing	8	3.9%
Agriculture	7	3.5%
Construction	7	3.5%
Recreation	5	2.5%
Event services	5	2.5%
Fitness	5	2.5%
Wholesale trade	5	2.5%
Information technology or services	3	1.5%
Education	2	1%
Grocery	2	1%
Property management	2	1%
Research or laboratory services	2	1%
Legal services	1	<1%
Transportation or warehousing	1	<1%
Total	202	100%

Table B. Business location (by county)

COUNTY	# OF BUSINESSES	% OF TOTAL
Placer	81	40%
Nevada	74	37%
Plumas	14	7%
Inyo	14	7%
El Dorado	6	3%
Modoc	4	2%
Shasta	3	1%
Mono	2	1%
Butte	1	<1%
Lassen	1	<1%
Trinity	1	<1%
Tuolumne	1	<1%
Total	202	100%

Table C. Years of business experience per respondent

# OF YEARS IN BUSINESS	# OF RESPONDENTS	% OF TOTAL
≤5	68	34%
6-10	41	20%
11-20	45	22%
>20	48	24%
Total	202	100%

Table D. Peak employment in 2019

PEAK # OF EMPLOYEES IN 2019	# OF BUSINESSES	% OF TOTAL
≤5	117	59%
6-10	29	14%
11-20	34	17%
21-50	16	8%
51-100	3	2%
>100	1	<1%
Total	200	100%



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