

CASE STUDY – WEST BABINE RIVER FIRE, BRITISH COLUMBIA, 2018

*PRIVATE CITIZENS SUPPORTING THE PROTECTION OF THEIR
OWN INFRASTRUCTURE*

Ray Ault

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This case study is not restricted.

This case study contributes to the state-of-practice review of water delivery systems (sprinklers) in the wildland-urban interface. Funding for this review was provided by the Forest Resource Improvement Association of Alberta (FRIAA).

Sprinklers are used to protect structures from wildfire during wildland-urban interface events across Canada. Traditionally, standard forestry equipment has been used in conjunction with impact sprinklers. FPInnovations is reviewing common practices and equipment used during sprinkler deployments, in Canada, to determine if they are the most appropriate for community structure protection, or if alternative approaches should be considered.

This case study documents the steps a lodge owner took to protect his structure and how private citizens, wildfire, and municipal fire agencies worked collaboratively during the West Babine River fire that occurred in August 2018.

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CASE STUDY

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AUTHOR CONTACT INFORMATION

Ray Ault

Wilderness Fire Management Inc.

(780) 658-2282

raymond.ault@gmail.com

REVIEWER

Chad Gardeski

Manager – Wildfire Operations

(780) 817-1440

chad.gardeski@fpinnovations.ca

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1. INTRODUCTION

The use of forestry equipment (hose and pressure pumps) to support sprinkler systems is a common approach to protecting values at risk from wildfire in Canada. This case study is one in a series that explores the viability of various types of sprinkler systems for protecting residential and commercial structures from wildfire.

Wildfire agencies are often called upon to protect remote structures from wildfire. The priority for fire crew deployment is first and foremost to protect life, followed by other values at risk. Private and commercial sporting lodges located in forested areas are at risk from wildfire, and protection of these structures can be difficult when multiple fires are threatening numerous locations. Owners of remote structures are advised to be prepared and have the necessary on-site equipment to protect their property.

This case study examines the deployment of equipment purchased locally, by a remote commercial fishing lodge that is not accessible by road, in order to protect its assets from wildfire.

2. SITE DESCRIPTION

Commercial fishing lodge

The fishing lodge was surrounded by small stands of coniferous timber to the east and west, the Babine River to the South, and an airstrip to the North that provided a fuel break between the buildings and the forest (Figure 1). All the structures had tin roofs. The lodge, four cabins, generator building, and carpenter shop were clustered together between the airstrip and the Babine River. Drums of fuel and propane were located at the east end of the buildings. The area surrounding the buildings was clean of debris, as outlined in the FireSmart Canada guidelines for Priority Zone 1.

3. WILDFIRE THREAT

West Babine River fire

The West Babine River fire (R41913) was 1 of 11 active fires burning in the Bulkley Fire Zone on August 13, 2018. The fire burned on both sides of the Babine River inside the Babine River Corridor Provincial Park. The fire was situated 45 km northwest of Fort Babine, British Columbia (B.C.) and 45 km northeast of Hazelton, B.C.

The fire was expected to threaten the fishing lodge from the north on August 14th. By August 15th the West Babine Fire was estimated to have burned 7400 ha and was less the 3 km from the fishing lodge.

4. DATA COLLECTION

Notes of the sprinkler deployment were made while assisting in the placement of equipment and testing of the water delivery system. Data on equipment specification was collected from manufacturer websites and telephone calls with equipment retailers.

5. FINDINGS

5.1 Deployment logistics

On August 13th the Bulkley Zone Wildfire Coordination Officer determined that the West Babine River fire was a threat to the lodge and that structure protection was required. A morning meeting was held with the lodge representative. It was agreed that the lodge owner would source the fire equipment and that a Structure Protection Specialist (SPS) would be assigned to develop a sprinkler deployment plan (Figure 2).



Figure 1. Google aerial map of the lodge buildings, airstrip and the Babine River.

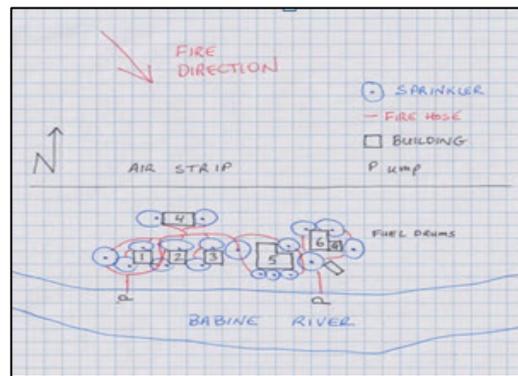


Figure 2. Sprinkler Deployment Plan.

The lodge owner purchased two Honda WH20XTC pressure pumps (Figure 3) from a local forestry equipment dealer. Both pumps were fitted with a 65-mm (2-in.) suction hose, foot valve, and 38-mm (1.5-in.) quick connect discharge hose fitting. Standard forestry hose, 38-mm (1.5-in.), was not available from local retailers, so it was provided, on loan, by the B.C. Wildfire Service. Eight lengths of 38-mm (1.5-in.) forestry hose and 20 lengths of 16-mm (5/8-in.) econo flow hose were provided. Fifteen 16-mm (5/8-in.) water thief valves and five 38-mm (1.5 in.) wye valves were required along with a 38-mm (1.5 in.) end cap. Fuel for the pumps was provided by the lodge.

A search for sprinklers in the community was unsuccessful. The lodge owner found that all the retailers were sold out of sprinklers. The lodge ordered sprinklers from an irrigation supplier in another community and arranged for pick up. Impact sprinklers with a 4-mm (5/32-in.) nozzle were purchased from an irrigation supplier. The sprinklers were “part circle type” and were capable of supplying 13.25 L/min. (3.5 gpm) at 310 kPa (45 psi) and 16.7 L/min. (4.4 gpm) at 276

kPa (40 psi). For this deployment, 19 sprinklers were used, and the pressure was calculated at 40 psi flowing a total of approximately 66 gpm.¹

In the afternoon, a Structure Protection Specialist from the Office of the Fire Commissioner, a B.C. Wildfire Service representative, and a lodge representative completed a site assessment and developed the sprinkler deployment plan.



Figure 3. Honda WH20XTC pressure pump.

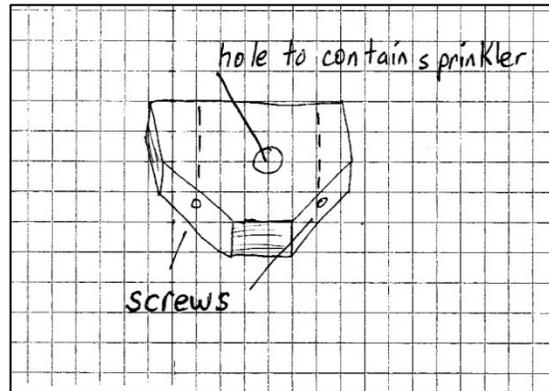


Figure 4. Carpenter designed wood sprinkler cradles for attachment to the roof eaves.

5.2 Sprinkler deployment

On August 14th, multiple fires and the potential for structure loss resulted in a Structure Protection Specialist and a Structure Protection Crew being assigned to deploy sprinklers on various lodges along the Babine River.

A B.C. Wildfire Service supervisor and initial attack crew were tasked with deploying sprinklers for at the fishing lodge. The team drove to the closest road accessible point to the lodge. A helicopter working on a nearby fire was diverted and assigned to transport the team and equipment from this point to the remote fishing lodge.

The crew was met on-site by the lodge manager, guide, and helper around 12:00 to begin deploying the sprinkler system. The lodge manager, who was also a carpenter, pre-built wooden cradles (Figure 4) to attach the sprinklers to the roof eaves in preparation for the wildfire event. The sprinklers were installed in a way that would minimize damage to the buildings. In total, seven people were on-site for the sprinkler installation.

Sprinklers on the front of cabins 1, 2, and 3 were adjusted to spray over the deck and between the cabins using a 270° casting pattern (Figure 5). Of the 19 sprinklers deployed, 14 were attached to the roofline, 3 were mounted on tripods (Figure 6), and 2 covered the main lodge

¹ The pump curve for a similar sized Honda pump (WH20xtf) was used. Using this curve, at 42 psi, the flow is 66 gpm.

deck (Figure 7). The sprinklers were generally allowed to spray in a full circle pattern. The deployment was completed within 2.5 hours.



Figure 5. Sprinklers set to 270-degree arc at the front of the cabins.



Figure 6. Firefighter testing a tripod mounted sprinkler.

The system was tested and the Structure Protection Specialist determined that one pump was sufficient to supply the 14 sprinklers for the lodge and cabins. The lodge manager was concerned about the potential for water damage on the front of the main lodge building, so the number of sprinklers on the deck was reduced from three to two (Figure 7) and the plan was to activate the



Figure 7. Sprinklers on the main lodge deck before reconfiguration.

deck sprinklers only if the main lodge was under imminent wildfire threat. The second pump was reconfigured to supply five sprinklers on an additional hose line that provided protection for the generator, fuel shed, and fuel drums. The re-deployment, fine tuning of the sprinklers spray patterns, and re-configuration of the pumps was completed by 15:00.

6. DISCUSSION

During an exceptionally busy fire season, it is difficult for the Province to have sufficient equipment to adequately protect all structures on the forested landbase. When private citizens are able to provide for their individual structure protection needs, it lessens the load on the Province in terms of equipment and number of resources required for protection.

The purchase of structure protection equipment tends to be event driven. In this case, the lodge owner decided to purchase equipment in response to an active and threatening wildfire but had

challenges sourcing the equipment required. Private citizens should be encouraged to source equipment well in advance of a wildland-urban interface event and familiarize themselves with how to deploy and operate it. Tools that recommend appropriate equipment that is easy to install and can be effectively managed by agency resources are available.² If these resources are deemed appropriate, they can be provided to help build citizen's capacity in advance of a wildland-urban interface event. If not appropriate, specific resources can be developed.

In cases where the owners are under evacuation order, activation of the sprinkler system needs to be completed by the agencies responsible for structure protection. Incorporating remote operation technologies into water delivery systems would reduce the agency resources required to test and activate these systems.

Clear trigger points for sprinkler system activation should be included in the Incident Action Plan (IAP) or other planning documents. These documents should be distributed to the relevant resources to ensure that the activation process is clearly understood. The IAP or other planning documents also inform replacement resources during transitions.

Further research needs to be done to explore and evaluate smaller four stroke engine alternatives to the standard Waterax Mark-3 wildfire pressure pump. The option to use smaller pumps in situations where fewer than 10 sprinklers are deployed can conserve the Mark-3 fire pumps for more appropriate fireline assignments. Smaller pumps, similar to the WH20XTC Honda pump, do not have the fuel capacity of the Mark-3. This needs to be taken into account during deployments.

7. CONCLUSION

When residents take responsibility for structure protection on their private property by implementing FireSmart guidelines and pre-positioning pumps, hose, and sprinklers ahead of a wildland-urban interface event, it not only increases the probability that their property will survive a wildfire but reduces the pressure on the limited number of firefighters involved in an incident.

² Gogal, J. (2018). *Wildfire water pumping and sprinkler system handbook* (4th ed.).



info@fpinnovations.ca
www.fpinnovations.ca

OUR OFFICES

Pointe-Claire
570 Saint-Jean Blvd.
Pointe-Claire, QC
Canada H9R 3J9
(514) 630-4100

Vancouver
2665 East Mall
Vancouver, BC
Canada V6T 1Z4
(604) 224-3221

Québec
1055 rue du P.E.P.S.
Québec, QC
Canada G1V 4C7
(418) 659-2647