



RiskRope

A three-metre, colour-coded rope that turns the highest-leverage measurements in wildfire science into something a homeowner can do with their own hands in under ten minutes guided by the free HomeWalk audio companion, with no course, no volunteer, and no brochure required. \$20 per unit (lower at scale). *The colour does the teaching. The rope does the measuring. The homeowner does the work.* Learn more at riskrope.com and firearc.ca.

Prepared for program and community partners.

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1. Executive Summary

For thirty years, Canada's wildfire preparedness programs have delivered the same thing: information. Brochures, courses, home visits, ambassador programs — millions of dollars in public investment, built almost entirely around telling homeowners what to do. Homes still burn at the same predictable points, for the same well-documented reasons.

RiskRope is a different kind of intervention. It's a three-metre, colour-coded cotton rope that turns three of the most consequential — and best-evidenced — measurements in wildfire science into something a homeowner can do with their hands in under ten minutes, guided the whole way by the Home Walk audio companion, with no course, no volunteer, and no brochure required.

- Red section (1.5 m): lay it against the foundation — the single highest-leverage zone in wildfire home protection.
- Black band (2 m): hold it against a tree trunk to find the pruning height that interrupts ladder fuel.
- Full rope (3 m): stretch it between tree crowns to confirm spacing that resists crown-to-crown fire jump.

THE BOTTOM LINE

RiskRope doesn't teach wildfire risk. It lets a homeowner discover their own risk, with their own hands, in their own yard, guided by the free Home Walk audio companion — and self-discovered risk is much harder to ignore than risk you were told about. Every measurement on the rope is backed by real, citable fire science, set out in full in this document.

2. Why Homes Actually Burn

The single most important idea underlying RiskRope comes from Dr. Jack D. Cohen, a research physical scientist who spent his career at the USDA Forest Service's Missoula Fire Sciences Laboratory. Cohen's field examinations of burned communities, paired with laboratory and experimental work, overturned a widely held assumption: that homes burn because a wildfire reaches them.

THE CORE FINDING

Most home destruction during wildfire is caused by burning embers landing on or near the structure — not by the flame front of an advancing wildfire itself.

Cohen's research found that a home's ignition potential during even the most extreme wildfires is principally determined by conditions within about 30 to 60 metres (100 to 200 feet) of the structure — not by fire intensity further away. This is the reason post-fire neighbourhoods so often show one home reduced to a foundation slab standing next to an untouched one: the same fire passed both, but only one had a home ignition zone that could catch.

Other institutions have independently reached the same conclusion. A 2019 insurance-industry study found that embers alone account for up to 90% of home and building ignitions in wildfires; FireSmart BC's own guidance puts the figure at roughly half of wildfire-attributed home fires, noting that the true share likely depends on wind, building materials, and counting method. Whichever figure is used, the direction is the same: managing the space immediately around a structure is the highest-leverage action a homeowner can take.

3. The Home Ignition Zone — Three Zones, Three Actions

FireSmart Canada and FireSmart BC organize the 30 metres around a home into three zones, aligned with NFPA guidance and the international home ignition zone model. This is the framework RiskRope's three measurements are built to serve.

Zone	Distance	Action	Why
Immediate Zone	0–1.5 m	Complete non-combustible clearance. No exceptions.	Where embers accumulate most; the single highest-leverage zone for reducing ignition risk.
Intermediate Zone	1.5–10 m	Fire-resistant landscaping; remove woody debris and combustible storage.	Manages what could carry fire toward the home, without yet addressing tree crowns.
Extended Zone	10–30 m	Prune branches to 2 m height; keep 3 m of horizontal space between tree crowns.	Interrupts the ladder-fuel pathway that can turn a surface fire into a crown fire.

Source: FireSmart Canada and FireSmart BC, “The Home Ignition Zone.” Both the pruning height and the crown-spacing standard are Extended Zone actions — ten metres out or beyond — covered in Section 4.

4. RiskRope — What It Measures, and How

RiskRope is a three-metre natural cotton rope with three dyed sections and no hardware, batteries, or assembly. It ships flat in a dark envelope with a die-cut window that reveals the red end before it's even opened — the first message is physical, before a single word is read.

Rope Section	Measures	Field Use
Red segment	1.5 metres	Lay flat against the foundation. Everything combustible inside this line comes out — furniture, mulch, stored items, anything that can catch an ember.
Black band	2 metres	Hold vertically against a tree trunk. Prune every branch below the band — this way a ground fire can't climb into the crown.
Full rope	3 metres	Stretch between two tree crowns. If the gap is shorter than the rope, the crowns need thinning until the rope fits.

Beyond the full rope length (3 m), move remaining combustibles further back. Beyond 10 m, professional judgment or a forest professional's guidance is recommended for anything beyond routine maintenance — slope, overlapping neighbour properties, and larger stands change the picture.

Finding the Extended Zone

The black band and full rope measurements are both Extended Zone actions, which formally start 10 metres out from the home. Two simple methods help find that line in the field:

- Pace it out: an adult's natural walking stride is roughly 0.75 m. About 13 average strides out from the edge of the Immediate Zone lands close to 10 metres.
- Rope-length method: laying the 3-metre rope end-to-end about three and a third times from the foundation reaches the same mark, using the object already in hand.

Design Philosophy

What makes RiskRope work is not what it adds but what it removes. There's no course to schedule, no volunteer to arrange, no manual to read before the measurement means anything. A homeowner picks it up, presses play on the Home Walk, and the object and the audio together tell them what to do and where.

5. The Home Walk

RiskRope answers where. The Home Walk answers why. A homeowner who measures without understanding what the measurement protects against is more likely to treat it as a one-time task than a habit worth repeating each season — the Home Walk closes that gap, and the walk begins the moment the envelope is opened.

What it is

A free, self-guided audio walking tour a homeowner presses play on before starting the walk with the rope in hand. It narrates why homes actually burn, then walks with the homeowner from the foundation to the trees, the same route the rope measures, pausing naturally at each zone transition so the listening keeps pace with the walking. No app, no login, no course to schedule — just press play and walk.

Why it works

The Home Walk extends the same discovery-based mechanism into the listening experience: it doesn't lecture, it accompanies. The homeowner is still doing the walking, the measuring, and the looking. The audio is only there to explain, in the moment, what each stop means and why it's worth doing correctly.

Access

Distributed by QR code, printed on RiskRope's packaging and hosted at firearc.ca/homewalk.

An optional record: before and after

Some homeowners will want proof of their own work, not just the experience of doing it. A simple, optional prompt at the start and end of the walk invites a quick phone photo of the same view — once before starting, once after the work is done. For homeowners who want a personal record, or who are participating in an insurer or municipal program that asks for one, a slow phone-camera pass around the perimeter, roughly 10 feet out and pointed at the house and then outward, works well as the standard.

6. The Science Behind Every Measurement

Red section — 1.5 metres, the Immediate Zone

This is the measurement with the strongest evidence base of any defensible-space distance in wildfire science. FireSmart Canada and FireSmart BC designate 0–1.5 m as the Immediate Zone requiring complete non-combustible clearance, aligned with NFPA guidance (0–5 feet) and rooted in Cohen's ember and radiant-heat research. The distance reflects how embers actually behave: lofted by a wildfire's convection column, they accumulate at the base of structures — in corners, against foundations, under decks — and any combustible material within 1.5 m creates a direct fuel path to the structure itself.

THE EVIDENCE

IBHS research found that an ember-resistant buffer in the first five feet (about 1.5 m) around a home cuts its risk of igniting in a wildfire in half, building on an IBHS/ZestyAI finding that clearing vegetation from the home perimeter nearly doubles a structure's likelihood of survival. In 2025, IBHS updated its Wildfire Prepared Home Standard to make this zone a mandatory requirement, not optional guidance.

Black band — 2 metres, the pruning height

A ladder fuel is any vegetation that lets fire climb from the forest floor into the tree canopy; low branches are the most common ladder fuel around homes. The foundational science here is Canadian: C.E. Van Wagner's 1977 paper established the model still used to predict when a surface fire will torch into a crown fire, built on the gap between surface fuel and the base of the canopy. The wider that gap, the more intense a surface fire has to be before it can reach the crown.

Pruning branches to 2 metres — the FireSmart Canada and FireSmart BC specification — raises that gap enough to interrupt the ladder-fuel pathway under moderate fire conditions. A surface fire that reaches a pruned trunk meets bark, which resists ignition far better than the thin, resinous branches and needles it would otherwise find at ground level.

Full rope — 3 metres, crown-to-crown spacing

Once fire enters one tree crown, it can spread horizontally to a neighbouring crown if the gap between them is too small — the mechanism that turns an isolated torching tree into a running crown fire. Van Wagner's model, extended by later work from Cruz and Alexander, established the density threshold at which this horizontal spread becomes self-sustaining. FireSmart Canada and FireSmart BC both specify at least 3 metres of horizontal space between single or grouped conifer crowns. A 2020 study by Alexander and Cruz directly tested this guideline against real lodgepole pine stands in Alberta and found it holds up as a reasonably conservative standard, not an arbitrary round number.

Why the distances matter everywhere — not just near the treeline

All three measurements matter regardless of how close a property sits to visible forest, because embers travel much farther than most homeowners assume. FireSmart BC's own published guidance states that embers travel an average of 2 kilometres before landing, with documented cases as far as 17 kilometres. A 2026 peer-reviewed radar and satellite study of the 2018 Camp Fire in California found firebrand transport up to 10 kilometres ahead of the main fire front, with most ignitions occurring within 1 to 5 kilometres — a scale that repeatedly overwhelmed containment efforts during that fire.

The practical implication: a property 2 kilometres from the nearest forest edge is not automatically safe under high fire-weather conditions. The 1.5-metre Immediate Zone is the last line of defence against an ember that may have already travelled a very long way to get there.

Summary

- Homes burn primarily from embers, not the advancing flame front — up to 90% of WUI home ignitions, per a 2019 insurance-industry study cited by FireSmart BC.
- The 0–1.5 m Immediate Zone is the single highest-leverage action available to a homeowner — IBHS: halves ignition risk; nearly doubles survival likelihood.
- Pruning to 2 m interrupts the vertical ladder-fuel pathway — Van Wagner; FireSmart Canada/BC.
- Maintaining 3 m crown gaps interrupts horizontal crown-to-crown spread — Van Wagner; Cruz & Alexander; field-validated in Alberta.
- Embers can travel from 2 km on average to over 10–17 km in documented cases — FireSmart BC; peer-reviewed Camp Fire research.
- The pruning and crown-spacing actions both begin 10 metres from the home — see Section 4 for how to find that line.

7. Why This Works: Persuasion, Not Instruction

FireSmart has delivered information for thirty years, at a cost of millions of dollars in public investment: brochures, courses, volunteer home visits, ambassador programs. Homes still burn. The problem was never really a lack of awareness; it was the gap between knowing something and acting on it.

THE FOUNDING INSIGHT

RiskRope doesn't try to close the awareness gap with more information. It skips the gap entirely and goes straight to the doing.

RiskRope doesn't tell a homeowner their house is at risk — it makes them prove it to themselves. FireSmart's existing model requires a person in the loop at every step: a volunteer to deliver the message, a course to transfer the knowledge, a home visit to make it concrete. Compliance is whatever fraction of people show up, pay attention, and then actually go home and act.

RiskRope changes the sequence. Nobody told the homeowner to do anything; they picked up an object, pressed play on the Home Walk, and walked around their own house and found their own answer. A risk you measured yourself, with your own hands, is much harder to unknow than a risk you were told about.

8. The National Opportunity

THE RESEARCH

Erni et al. 2021, Canadian Journal of Forest Research 51:1357–1367, finds that approximately 12.3% of the Canadian population currently lives in the wildland-urban interface — and that includes 32.1% of the on-reserve First Nations population, nearly three times the national rate. On-reserve WUI residents also face almost four times the short-interval fire exposure of the rest of the WUI population (17.8% vs 4.7%), a gap projected to remain roughly double by 2100 even under an optimistic emissions scenario.

Turning the population share into households

Canada's population was estimated at just over 41.4 million as of April 2026. Applying the 12.3% share to that population gives approximately 5.1 million people living in the WUI today. At Statistics Canada's national average household size of 2.4 people, that works out to approximately 2.1 million households.

THE HOUSEHOLD ESTIMATE

Roughly 2.1 million Canadian households, based on real, peer-reviewed, population-level research. Average household size in on-reserve and rural WUI communities may run somewhat higher than the national average of 2.4, which would push the true figure modestly upward.

Reconciling this with community-level figures

Two other figures are worth keeping alongside the population-based estimate above, because they measure something different and explain each other: a national WUI mapping study (Johnston & Flannigan, 2018) found that 60% of Canada's populated places — cities, towns, settlements, and reserves — have a substantial wildland-urban interface presence, and a completely independent 2026 consumer survey (Intact Financial Corporation / Léger) landed on the same 60% figure for Canadian communities.

That 60% is a count of communities, not people, and it isn't in tension with the 12.3% population figure — it explains it. The majority of Canada's thousands of towns, small cities, rural municipalities, and First Nations communities sit at least partly in the WUI, while the large majority of Canada's population is concentrated in a handful of big metro areas that mostly aren't. Both figures are true at once: most Canadian communities are WUI communities, but most Canadians don't live in one.

Province / Territory	WUI Area (ha)	Share of Land Area
Nova Scotia	2,431,164	45.1%
Prince Edward Island	178,185	31.1%

Province / Territory	WUI Area (ha)	Share of Land Area
New Brunswick	2,223,320	30.6%
British Columbia	5,520,686	6.4%
Ontario	5,853,788	6.6%
Quebec	6,984,261	5.6%
Alberta	3,165,144	5.1%
Manitoba	2,282,665	4.4%
Newfoundland and Labrador	1,221,610	3.6%
Saskatchewan	1,907,723	3.3%
Yukon	294,795	0.7%
Northwest Territories	202,113	0.2%
Nunavut	5,029	0.04%
Canada (total)	32,270,485	3.8%

Source: Johnston, L.M. & Flannigan, M.D. 2018. Mapping Canadian wildland fire interface areas. International Journal of Wildland Fire 27(1):1–14. Quebec, Ontario, Alberta, and BC have the largest total WUI areas; Nova Scotia, PEI, and New Brunswick have by far the highest WUI as a share of provincial land.

What this means as a program

Even at 2.1 million households, this is one of the largest addressable populations of any Canadian wildfire mitigation program to date — larger than any single FireSmart home-visit or ambassador initiative has reached, because RiskRope removes the person-in-the-loop bottleneck that limits how fast those programs can scale. A national distribution partnership — through FireSmart Canada's existing ambassador and community-coordinator network, provincial programs, or insurer-sponsored distribution — could put a physical, self-administered risk measurement into a meaningful share of these households well before most of them would otherwise encounter a FireSmart volunteer or course.

9. Product & Pricing

The object

Natural cotton rope, three dyed sections, no hardware, no batteries, no assembly. Ships flat in a dark envelope with a die-cut window revealing the red end before opening. A QR code links to the Home Walk audio guide, which walks through all three measurements as the homeowner moves through them.

Pricing

Item	Price
Retail / Initial Pilots	\$20 / unit
Sponsored / institutional	\$Variable based at scale (Targeting<\$10) / unit

Program partnership

A white-label pilot of 1,000 units at \$20/unit is available as an entry point for a program partner: finished units branded for distribution through multiple channels producing engagement data that supports scaling further.

Where it fits

RiskRope is the front door: the one point in FireArc's system where an aerial, data-driven picture of wildfire exposure becomes something an individual property owner can check by hand, in their own yard, with no training. Every scan of the packaging QR code is a measurable engagement event — trackable and reportable for a municipality or program funder — and a natural bridge to FireArc's broader wildfire intelligence tools for communities ready to go further.

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