



THE FOREST WILL BURN

https://www.youtube.com/watch?v=EHe_j4TV6Qk&t=327s&ab_channel=FPInnovations

21 Jan 2021

Charles Friesen



FPINNOVATIONS

IT'S NOT A
MATTER OF 'IF'
THE FOREST
WILL BURN, IT
IS 'WHEN' THE
FOREST WILL
BURN



FPINNOVATIONS

IN CANADA,
FORESTS BURN
REGARDLESS OF
HUMAN
PRESENCE.

ECOLOGICAL
RESEARCH HAS
REVEALED THERE
IS A NATURAL
RHYTHM TO THE
CYCLE OF FOREST
FIRES.



FPINNOVATIONS

WE HAVE BUILT OUR
TOWNS, CITIES,
INDUSTRIES, ROADS,
AND CRITICAL
INFRASTRUCTURE IN THE
MIDST OF THE FOREST.

WE ARE IN THE PATH OF
A NATURAL
DESTRUCTIVE CYCLE. IN
THE FACE OF OUR
CHANGING, CLIMATE,
THESE CYCLES ARE BEING
AFFECTED IN WAYS WE
DON'T YET
UNDERSTAND. WE NEED
TO PREPARE OUR
COMMUNITIES AS BEST
WE CAN.



FPINNOVATIONS

FOREST RESEARCHERS
AND SCIENTISTS,
INCLUDING,
GOVERNMENTS,
INDUSTRY AND
UNIVERSITIES ARE
WORKING WITH
VULNERABLE
COMMUNITIES TO
FIND SOLUTIONS AND
DEVELOP STRATEGIES.



FPINNOVATIONS

WHEN A FOREST
BURNS, AN IMMENSE
AMOUNT OF ENERGY
IS RELEASED.
UNCONTROLLED, THIS
ENERGY HAS
ENORMOUS
DESTRUCTIVE
POTENTIAL. IN 2018,
FIRES IN BC RELEASED
ENOUGH ENERGY TO
POWER ALL OF
CANADA FOR AN
ENTIRE YEAR.



FPINNOVATIONS

CAN HUMAN
INGENUITY
ADAPT TO THIS
NATURAL FIRE
CYCLE, AND RE-
DIRECT THIS
ENORMOUS
ENERGY
POTENTIAL TO
CONSTRUCTIVE
ENDS?



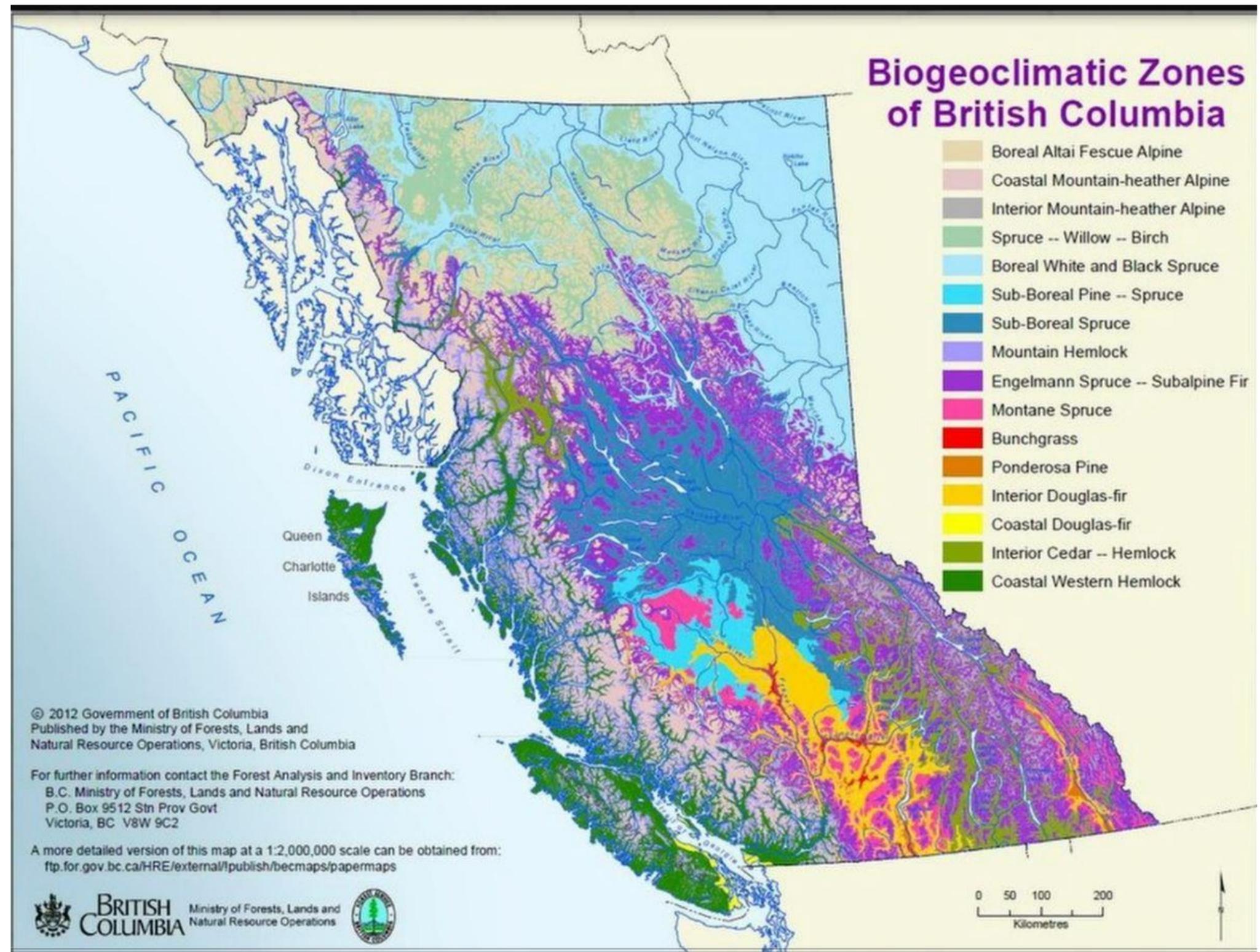
FPINNOVATIONS

THE FOREST WILL BURN WILL LOOK INTO A BOLD AND INNOVATIVE NEW STRATEGY, TO BOTH MITIGATE THE DESTRUCTIVE POWER OF FOREST FIRES WHILE AT THE SAME TIME HARNESSING THE ENERGY FOR CONSTRUCTIVE PURPOSES.



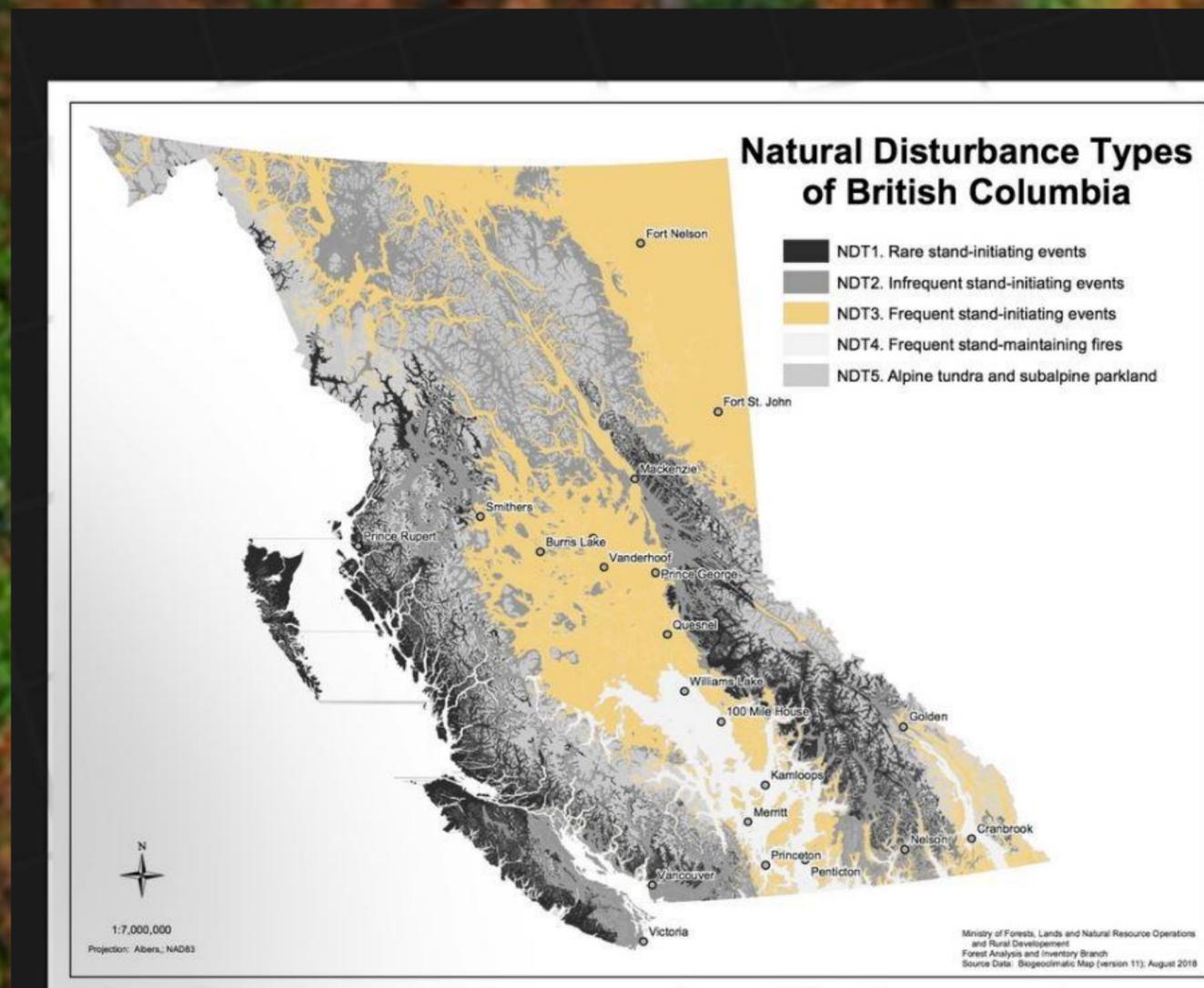
FPINNOVATIONS

IN BRITISH COLUMBIA, THE ENTIRE LANDBASE HAS BEEN CLASSIFIED INTO BROAD ECOSYSTEMS CALLED BIO-GEOCLIMATIC ZONES. THE LANDBASE HAS ALSO BEEN CLASSIFIED BY THE NORMAL CYCLES OF NATURAL DISTURBANCE THAT OCCUR IN EACH AREA. FOR EXAMPLE MUCH OF INTERIOR BC IS CLASSIFIED AS NATURAL DISTURBANCE TYPE 3, OR NDT 3.



FPINNOVATIONS

IN THE ECOSYSTEMS OF NDT3, THE NATURAL DISTURBANCE PATTERN IS CALLED FREQUENT STAND INITIATING EVENTS. THESE EVENTS TYPICALLY OCCUR EVERY 100 TO 125 YEARS, OR A SIMILAR INTERVAL. THE DISTURBANCE IS ALMOST ALWAYS FIRE, OR PERHAPS A WIDESPREAD MOUNTAIN PINE BEETLE OUTBREAK, WHICH MIGHT BE FOLLOWED A FEW YEARS LATER BY FIRE. A STAND INITIATING FIRE DESTROYS NEARLY ALL THE TREES AND RESETS THE NATURAL CONDITIONS FOR THE STAND TO REPLACE ITSELF.



NDT 3

FPINNOVATIONS

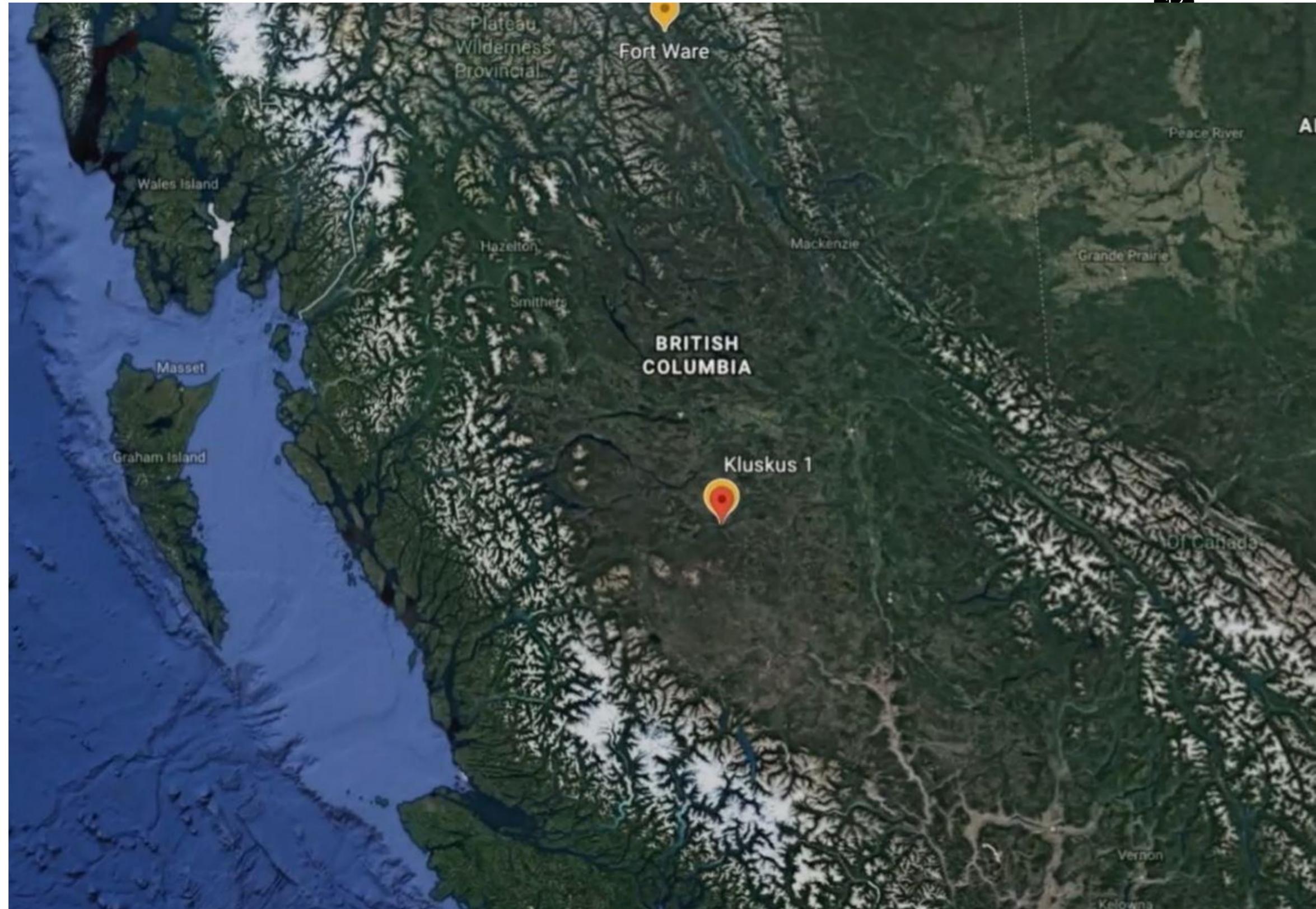
IN THIS VIDEO WE VISIT
THREE REMOTE FIRST
NATIONS COMMUNITIES
IN BRITISH COLUMBIA.

EACH OF THESE
COMMUNITIES IS OFF-
GRID. WHICH MEANS
THAT THEY ARE NOT
CONNECTED TO EITHER
THE ELECTRICAL
INFRASTRUCTURE GRID
OR THE NATURAL GAS
GRID. THEY ARE ALSO
SURROUNDED BY
FOREST, AND ARE
THREATENED BY FOREST
FIRES BECAUSE OF THE
NATURAL DISTURBANCE
PATTERNS IN THEIR
ECOSYSTEMS.



FPINNOVATIONS

WE START WITH
THE TINY
COMMUNITY OF
KLUSKUS OF THE
LHOOSK'UZ
DENE NATION



FPINNOVATIONS

FIRE STORMS IN THE
AREA THREATENED
THE COMMUNITY IN
2017 AND 2018
WIPING OUT MUCH
OF THE
SURROUNDING
FOREST AND
TERRIFYING THE
RESIDENTS AND
FORCING
EVACUATIONS



FPINNOVATIONS

THE SCALE OF
DESTRUCTION WAS
WIDESPREAD



FPINNOVATIONS

THE FIRE WAS SO INTENSE IT BURNED AWAY THE SOIL, DESTROYING PLANT AND ANIMAL POPULATIONS, INCLUDING AREAS FOR BERRIES AND TRADITIONAL MEDICINES



FPINNOVATIONS

TO PROTECT
ITSELF, THE
COMMUNITY
HAS CREATED A
FUEL
REDUCTION
AREA AROUND
THE TOWN.



FPINNOVATIONS

REMOVED MATERIAL
CREATES FIREWOOD,
SAWLOGS FOR A
SMALL SAWMILL,
AND BIOMASS TO
PRODUCE
ELECTRICITY THAT
WILL REDUCE THE
RELIANCE ON
TRUCKED-IN DIESEL



Burns Diesel
200 litres / 24 hours
Costs Over
\$100,000 / year

FPINNOVATIONS

FPINNOVATIONS
AND THE NATIONAL
RESEARCH COUNCIL
OF CANADA HAVE
PRE-TESTED A
COMBINED HEAT
AND POWER PLANT
(OR CHP), SO THAT IT
WILL REQUIRE
MINIMAL
ATTENTION WHILE
OPERATING IN A
REMOTE
COMMUNITY.



Testing site
of combined heat and power plant
for Kluskus

FPINNOVATIONS

THE COMBINATION
OF FIRE HAZARD
REDUCTION AND
USING THE
RESULTING BIOMASS
TO PRODUCE
ENERGY,
IS A WIN FOR THE
COMMUNITY



Kluskus

Natural Disturbance Type 3

FPINNOVATIONS

NEXT WE VISIT THE
ESKETEMC
COMMUNITY AT
ALKALI LAKE



FPINNOVATIONS

IT IS IN NATURAL
DISTURBANCE TYPE
4 WHICH IS CALLED
FREQUENT STAND-
MAINTAINING FIRES.

Natural Disturbance Type 4

Frequent Stand Maintaining Fires



FPINNOVATIONS

PAST FOREST
MANAGEMENT AND
FIRE SUPPRESSION
PRACTISES HAVE LED
TO A BUILD UP OF
SURFACE BIOMASS,
CALLED LADDER FUELS
IN THE FOREST
UNDERSTOREY.

WHEN FIRE STARTS ON
THE GROUND, IT CAN
THEN LADDER UP INTO
THE TREE TOPS AND
CREATE AN OUT-OF-
CONTROL CROWN FIRE



FPINNOVATIONS

THE PEOPLE OF
ALKALI LAKE HAVE
UNDERTAKEN THEIR
OWN FOREST
MANAGEMENT
ACTIVITIES, THAT
REFLECT MORE
HISTORICALLY
NATURAL,
ECOSYSTEM
CONDITIONS.

THEY PERFORM
STAND THINNINGS
TO CREATE A MORE
OPEN STAND.



FPINNOVATIONS

THE TREATMENT
CREATES BIOMASS.

IT ALSO CREATES
JOBS FOR
COMMUNITY
MEMBERS.



FPINNOVATIONS

THE BIOMASS IS
CHIPPED FOR USE IN
A LOCAL PLANT TO
CREATE HEAT.



FPINNOVATIONS

HEAT FROM THE PLANT IS PIPED UNDERGROUND TO LOCAL BUILDINGS REDUCING THE NEED FOR TRUCKED IN PROPANE.

THE PLANT COST \$4,000,000

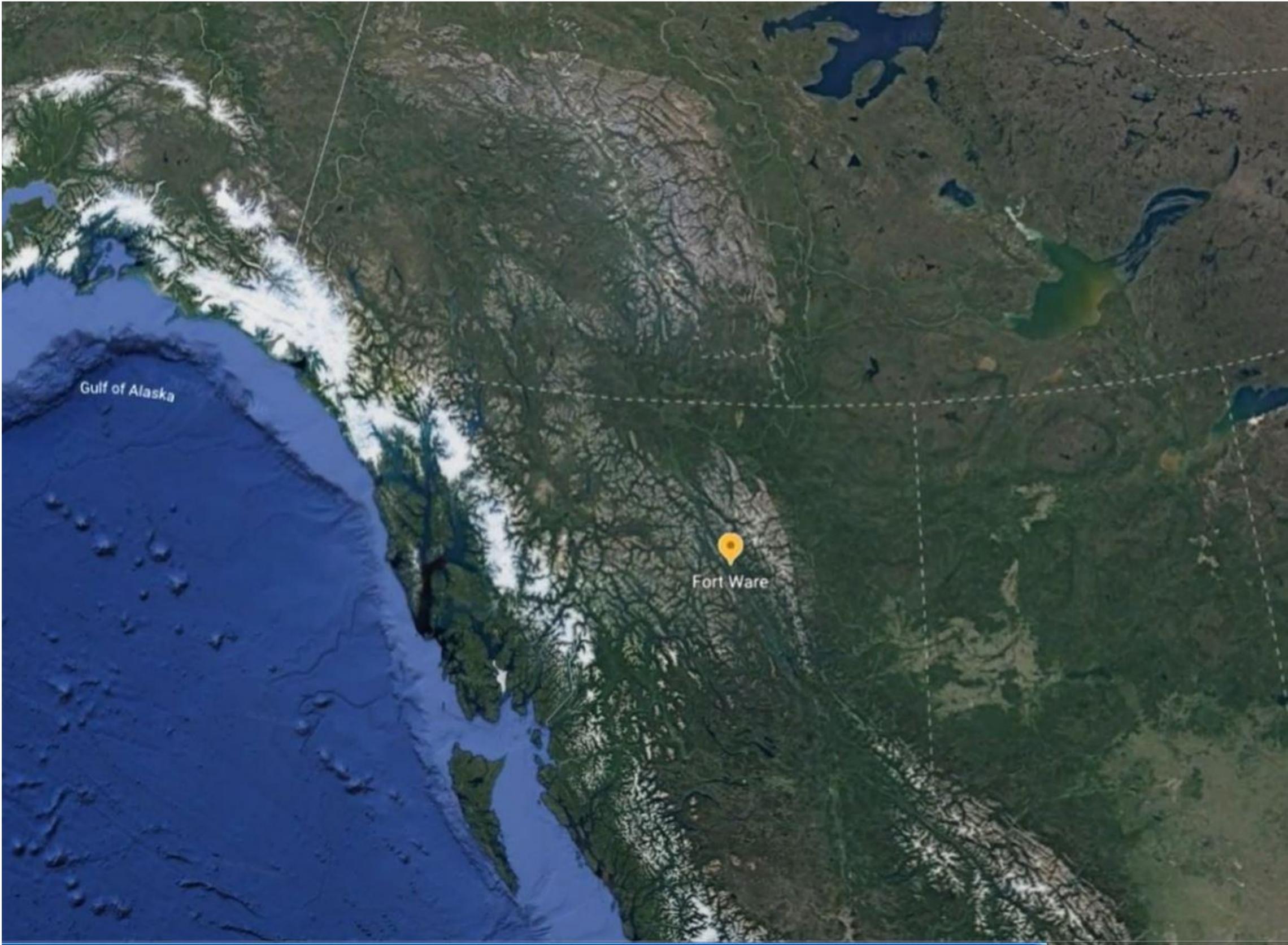
AND WILL PAY FOR ITSELF IN 4 -10 YEARS.



Pay for itself
4 - 10 Years

FPINNOVATIONS

NEXT WE VISIT
THE KWADACHA
NATION AT FORT
WARE



FPINNOVATIONS

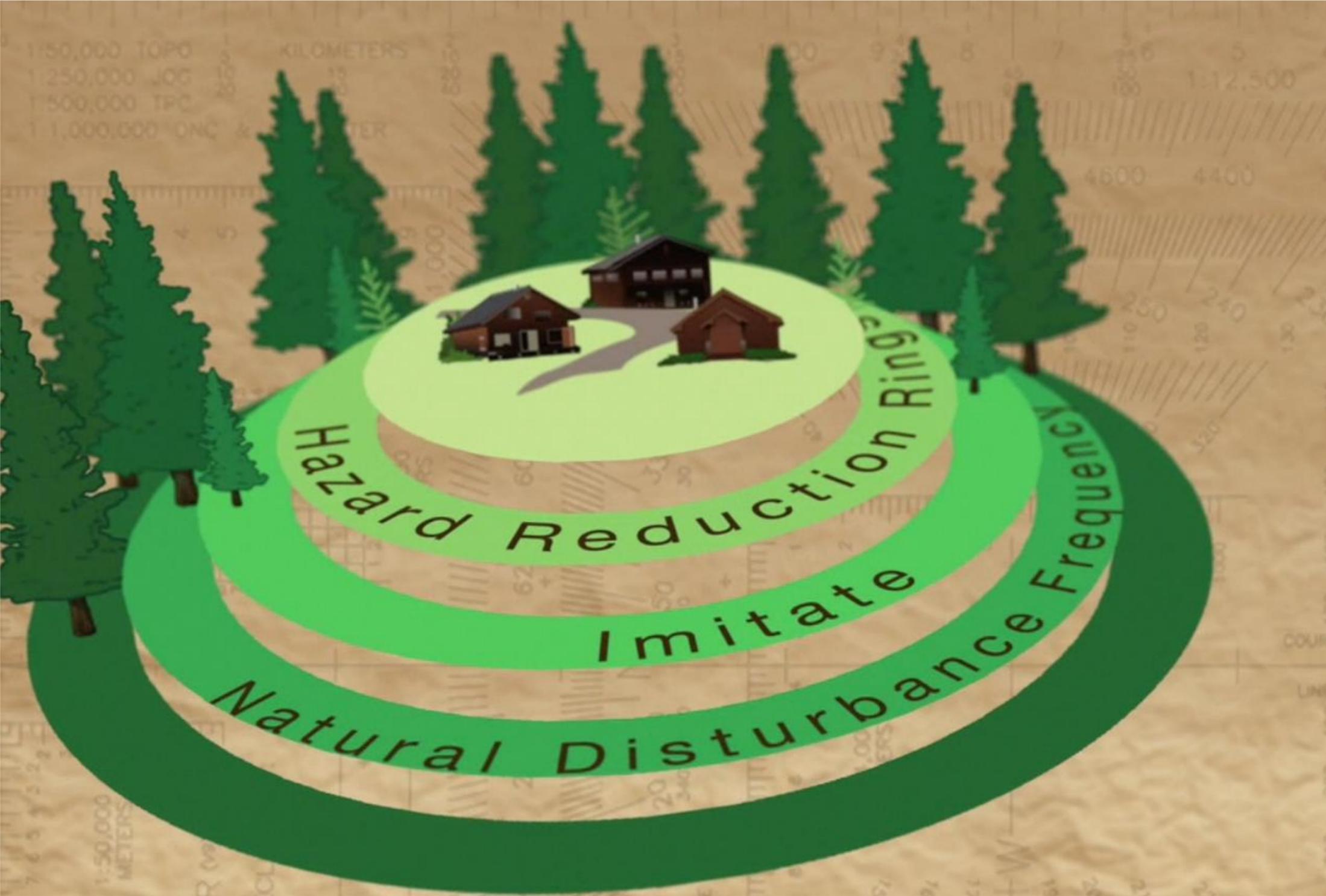
FORT WARE IS ABOUT 400 KM FROM THE NEAREST TOWN, AND IS IN NATURAL DISTURBANCE TYPE THREE: FREQUENT STAND INITIATING FIRES.

BECAUSE OF DEAD TREES FROM THE MOUNTAIN PINE BEETLE EPIDEMIC, THE FIRE RISK IS HIGH.



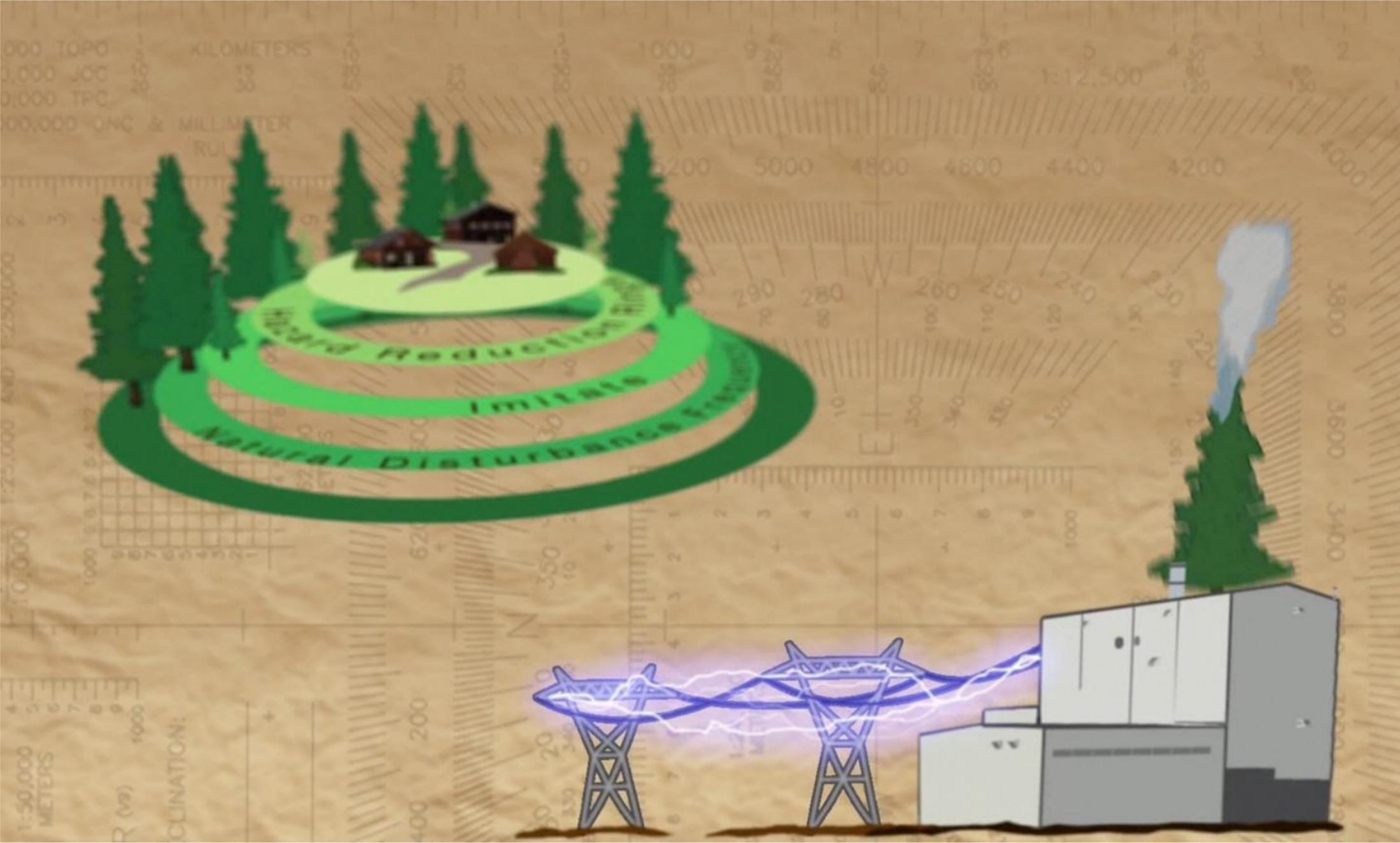
FPINNOVATIONS

BECAUSE OF THIS THREAT OF FIRE, A TREATMENT REGIME WAS PRESCRIBED. IT IS APPROPRIATE WHERE A NATURAL DISTURBANCE PATTERN OF STAND-INITIATING FIRES, OR CROWN FIRES, OCCURS EVERY 100 TO 125 YEARS.



FPINNOVATIONS

THE IDEA IS FOR HAZARD REDUCTION RINGS TO IMITATE THIS NATURAL DISTURBANCE FREQUENCY AND PROVIDE BIOMASS TO PRODUCE ENERGY IN A POWER PLANT.



FPINNOVATIONS

THE COMMUNITY IS AT THE CENTRE OF THE RINGS. EACH RING IS 2 KM WIDE.

THIS IS WIDE ENOUGH TO SIGNIFICANTLY REDUCE THE CHANCE OF A CATASTROPHIC HIGH INTENSITY FIRE AND IMPROVE SUCCESS IN DETECTION AND SUPPRESSION.



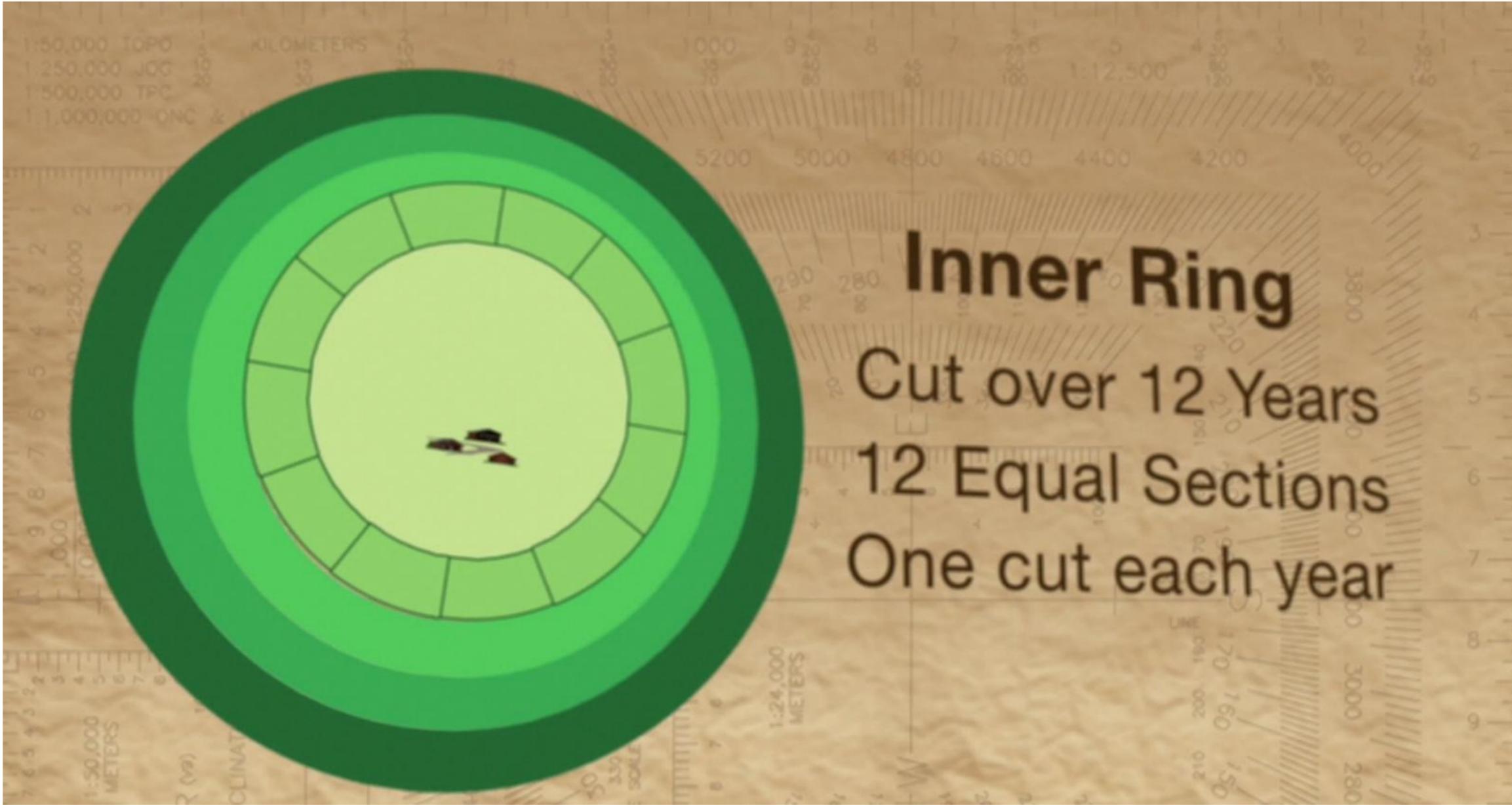
FPINNOVATIONS

THE INTERFACE ZONE CAN USE A SPECIAL TYPE OF FIRESMART TREATMENT THAT INVOLVES THINNING AND PRUNING THE STAND, LIKE WE SAW IN ALKALI LAKE.



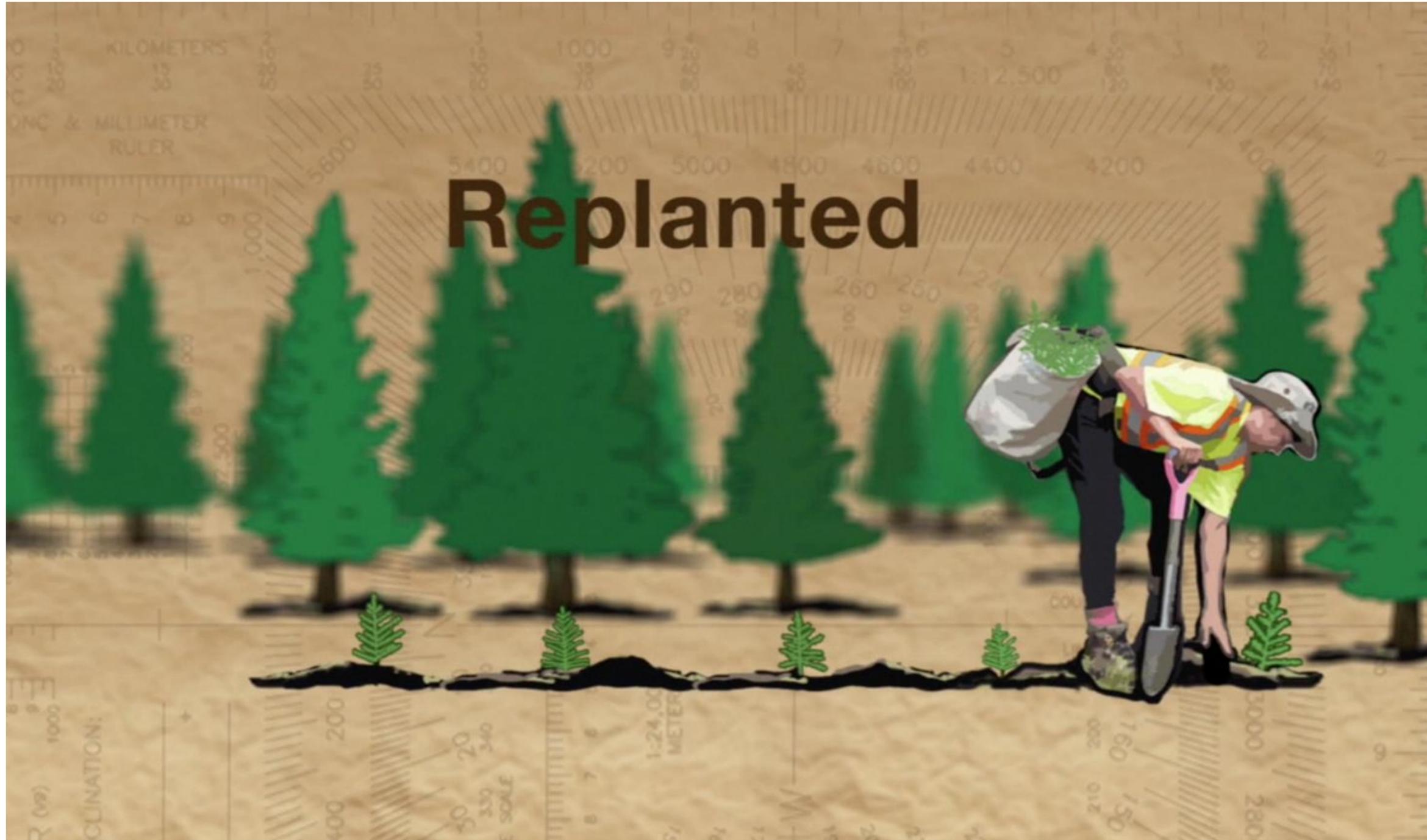
FPINNOVATIONS

THE INNER RING IS
CUT OVER THE
COURSE OF 12
YEARS – IT IS
DIVIDED INTO 12
EQUAL SECTIONS
AND ONE SECTION IS
CUT EACH YEAR.



FPINNOVATIONS

EACH YEAR'S HARVEST IS REPLANTED AFTER CUTTING SO THAT SUPPLY IS CONTINUAL, AND THE FOREST ALWAYS GROWS BACK TO SUPPORT LOCAL PLANT AND ANIMAL SPECIES.



FPINNOVATIONS

THE INNER RING IS CUT FIRST TO IMMEDIATELY REDUCE THE HAZARD FOR THE TOWN.

THE FIRST AREA CUT IN EACH RING IS IN THE DIRECTION OF THE PREVAILING WINDS.



FPINNOVATIONS

THE NEXT RING TO BE CUT IS THE OUTER RING, OVER 40 YEARS, IN ORDER TO REDUCE RISK TO THE GROWING STOCK.

THEN, THE NEXT OUTER-MOST RING IS CUT. THEN THE FINAL RING IS CUT.



FPINNOVATIONS

ONCE A SECTION IS CUT IT WILL PROVIDE SIGNIFICANT RESISTANCE TO FIRE DEVELOPMENT UNTIL AGE 20, AND GOOD RESISTANCE TO FIRE TILL AGE 40.

THIS MEANS THAT A 4 KM WIDTH OF LAND IS HELPING TO REDUCE THE CHANCE OF A CATASTROPHIC HIGH INTENSITY FIRE.

BECAUSE THE REGROWING TREES ARE SMALL AND HAVE WIDELY SPACED CROWNS.



FPINNOVATIONS

ONCE THE LAST RING IS CUT AFTER 100 YEARS, THE FIRST RING WILL BE READY FOR CUTTING AGAIN.



Once the last ring is cut after 100 years the first ring will be ready for cutting again

FPINNOVATIONS

IN FORT WARE,
DIESEL AND
PROPANE ARE
TRUCKED IN FOR
MORE THAN 400 KM
ON SLOW ROADS TO
SUPPLY BC HYDRO'S
LOCAL ENERGY GRID.
IT IS SUPPLEMENTED
BY A BIOMASS-
DRIVEN CO-HEAT
AND POWER PLANT
THAT HAS BEEN IN
OPERATION SINCE
2016.



FPINNOVATIONS

THE BIOMASS PLANT
SUPPLIES
ELECTRICITY AND
HEAT FOR
COMMUNITY
BUILDINGS



FPINNOVATIONS

THE PLANT
PROVIDES LOCAL
EMPLOYMENT FOR
ITS RUNNING AND
MAINTENANCE



FPINNOVATIONS

COMMUNITY
BUILDINGS LIKE THE
SCHOOL AND
ELDERS CENTRE ARE
HEATED FROM THE
BIOMASS PLANT.



FPINNOVATIONS

THE FIRESMART
TREATMENTS
REQUIRE LABOUR
THAT CREATES JOBS,
WHILE PROVIDING
PROTECTION FOR
THE COMMUNITY,
AND BIOMASS TO
PRODUCE ENERGY.



FPINNOVATIONS

LARGE LOGS FROM THE FIRE TREATMENTS ARE MILLED IN THE COMMUNITY SAWMILL. THESE PROVIDE BOARD AND BATTEN FOR HOMES, AS WELL AS SPAWNING A BUSINESS IN BRIDGE MODS AND OTHER EXPORT PRODUCTS.



FPINNOVATIONS

THE GREENHOUSE
GETS HEAT FROM
THE BIOMASS
PLANT.

FRESH VEGETABLES
ARE PROVIDED TO
BAND MEMBERS.

SO MUCH IS
PRODUCED THAT A
NEIGHBOURING
FIRST NATION AND
LOCAL RESOURCE
CAMPS CAN BE
SUPPLIED AS WELL.



FPINNOVATIONS

THE BIOMASS SYSTEM CREATES JOB IN FORESTRY FIRE TREATMENTS, IN SAWMILLING, IN RUNNING THE BIOMASS PLANT, IN THE GREEN HOUSE, AND IN BUSINESS ADMINISTRATION. THIS STRENGTHENS THE HEALTH AND ECONOMY OF THE WHOLE COMMUNITY.



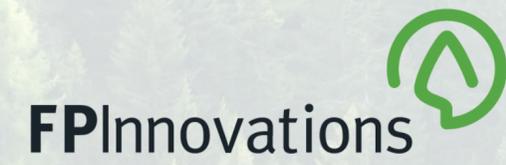
FPINNOVATIONS

FOR COMMUNITIES
IN THE FOREST, THE
THREAT OF FIRE AND
DESTRUCTION
LOOMS. BUT WITH
PROPER PLANNING
THAT IMITATES
NATURAL
DISTURBANCE, THE
THREAT CAN BE
CONTROLLED AND
THE POWER OF FIRE
CAN BRING
OPPORTUNITY, JOBS,
INDEPENDENCE,
ENERGY, AND FOOD.



The Forest Will Burn





GET IN TOUCH/COMMUNIQUEZ AVEC NOUS

Charles Friesen
charles.friesen@fpinnovations.ca
778-808-5679