Putting fire out on the land:
Mobilizing traditional and historical knowledge with science in fire management

S.E.R. Leverkus PhD RPBio PAg FIT AFE Certified Wildland Fire Practitioner
Canadian Institute of Forestry, Nanaimo - November 7 2018
Shifting Mosaics Consulting and Northern Fire WoRx Corp. – Fort Nelson, BC
Shifting paradigms
Talk it and walk it
Rx fire: the application of fire on the land through the use of a prescription which outlines trt, specific goals, mgmt objs, and distribution through space and time → scale

Photo credit: S.J. Neudorf
**Rx fire = intentional application of fire**

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**PREScribed FIRE BURN PLAN**

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<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
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Submitted by:

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<tr>
<th>Company or Agency &amp; Applicant Name:</th>
<th>Date:</th>
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<tr>
<td>Liard River Ventures (Prescription developed by Sonja Levekus, RPBio, PAg, FIT - Shifting Mosaics Consulting)</td>
<td>Feb. 28, 15</td>
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<th>Signature:</th>
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<td></td>
<td>8 years of prescribed fire experience for range management and habitat enhancement</td>
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Reviewed by: (may have more than one reviewer)

**REVIEWER MUST BE QUALIFIED ACCORDING TO THE COMPLEXITY RATING OF THIS FIRE.**

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Signature: Certification Level:

PREScribed FIRE BURN PLAN APPROVED:
Designated Forest Official – Protection

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Rx fire – landscape level

Rx fire = fighting fire with fire

Photo credit: S.E.R. Leverkus
Time since fire
Pyrogenesis
resulting from severity/intensity etc

August 2009

June 2009

August 2009

August 2010
Dominant disturbance process = fire

- Fire-adapted species, **oral accounts**, fire scars, charcoal and pollen, maps, reports, aerial imagery

- Lightning + **anthropogenic → 70 reasons** – Lewis
  - Improves forage production, quantity and palatability
  - Modifies fuel loads and reduce wildfire
  - Used to manage plant diseases, internal and external animal parasites ie.

Traditional and cultural*fire

- Dr. Henry Lewis “Fires of Spring” and “A time for burning”
- K. Hoffman “Burning Bog”
- FNFN and SMC FNFN*fire “Imagine the Fire”
  - Documented TEK oral history
Humans have been lighting fire for a long time

FNFN Fire Project 2009 - 2015

- Re-growth of vegetation
- Hunting and survival
- Comfort and aesthetic practices
- Ceremony
- Light
- Communication
- Warmth and cooking

Dene - Lewis (1978), Gottesfeld (1994)
- Gitxsan and Wet'suwet'en
General themes from interviews:

- Fire is a necessity
- The art of tending fire should be taught at a young age
- Fire is a serious and respected art to the Dene and Cree people

“The Dene and Cree have a traditional and cultural interaction with fire. Fire is a vital practice that must be continued and passed down to the next generations.”
Historical fire LEK

Human fire continues in the north with GO’s, Ranchers, Range Tenure holders

Photo credit: S.E.R. Leverkus
Fire ➞ shifting mosaics (patchwork) across the landscape through space and time resulting in heterogeneity (differences in vertical structure, distribution and composition) = biodiversity

It’s all about TSF and # times burned spatiotemporally

Pyric herbivory – herbivory driven by fire (Fuhlendorf et al. 2009)

Photo credit: S.E.R. Leverkus

Christensen 1997; Wiens 1997; Fuhlendorf and Engle 2001; Fuhlendorf et al. 2006 and 2009
• How to best manage this landscape?
• Priority species? Endangered species?
• Cultural interactions? Treaty rights?
• Resident rights?
• Predator/prey relationship?
• Winter range? Critical resources?
• Commercial opportunities?
• Changing climate?
• Social licence? Political will?
• Migratory routes?
• Natural resource development?
<table>
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<tr>
<th>Species</th>
<th>Provincial Listing</th>
<th>Bare rock</th>
<th>Open rangeland/alpine/sub-alpine</th>
<th>Open forest</th>
<th>Dense forest</th>
<th>Water/riparian</th>
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<tr>
<td>Humans</td>
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<tr>
<td>Horse</td>
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<tr>
<td>Woodland caribou</td>
<td>special concern/endpoint or threat</td>
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<tr>
<td>Mountain goat</td>
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<td>Thinhorn stone sheep</td>
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<td>Grizzly bear</td>
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<td>special concern</td>
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<td>Fisher</td>
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<td>Peregrine falcon</td>
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Leverkus et al. 2017

There is an important role of variable time since fire across the land!
West Coast Fire? What do we know?
What do we need to know?

PRELIMINARY OBSERVATIONS ON SEASONAL MOVEMENTS AND HABITAT USE BY VANCOUVER ISLAND ROOSEVELT ELK

D.W. Janz
Ministry of Environment
Nanaimo, British Columbia

Karei Klinka and Han Y. H. Chen, Forest Sciences Department, University of British Columbia, Vancouver, B.C., Canada, V6T 1Z4
Qingyi Wang, Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang 110015, P.R. China
and
Louise de Montigny, Research Branch, B.C. Ministry of Forests, Victoria, B.C. Canada, V8W 3J7

Forest Canopies and Their Influence on Understory Vegetation in Early-Seral Stands on West Vancouver Island

Conservation Biology

Contributed Paper

Defining Historical Baselines for Conservation: Ecological Changes Since European Settlement on Vancouver Island, Canada

ANNE D. BJORKMAN* AND MARK VELLEND
Departments of Botany and Zoology, Biodiversity Research Centre, University of British Columbia, Vancouver, BC V6T 1Z4, Canada
Discussion Paper

BC Journal of Ecosystems and Management

Disturbance regimes in coastal British Columbia

Lori D. Daniels¹ and Robert W. Gray²

Holocene Fire History of a Coastal Temperate Rain Forest,
Vancouver Island, British Columbia, Canada

Daniel Girard Gavin


Dr. Nancy Turner
Burning Bog https://www.youtube.com/watch?v=1bA9GXKTWcs
Others?
The “South & East Vancouver Island Fuel-Smoke Burn Plan” was initiated through a series of meetings with Government and Forest Industry in the fall of 2005 to “Deal with Slash” as recommended in the *Filmon Report* from the devastating 2003 fire season. A balance was required to address the air quality issues from any resulting open burning of slash debris.

The output from these meetings was the May 01, 2006 through April 30, 2007 term of the “South & East Vancouver Island Pilot Fuel-Smoke Burn Plan”. Through this period of pre-planning meetings with the signatories (Ministries of Forest & Range and Environment, and TimberWest Forest Corp. and Island Timberlands Ltd.), and essentially one fall-winter burning season, several learning’s and validation through documentation was realized.
Coastal Fire Centre

A brief fire history analysis by Leverkus
Coastal Fire Centre Fire 2018
Coastal Fire Centre 2018

Data acquired Nov. 5 2018 – polygon-BCWS
ArcGIS10.5 (ESRI)

Coastal Fire Centre
Current = 2018-06-07 to 2018 – 11 – 01
Count: 92
Minimum: 0.853001 ha
Maximum: 77, 136 ha
Sum: 211, 390 ha 2018
Mean: 2, 297 ha
Cause – not listed in data
Coastal Fire Centre 1918-2017

Historical 1918 – 2017 *does not include 2018

Count: 3518
Minimum: 0.002831
Maximum: 28,972 ha

Sum: 849,586 ha 1918 – 2017

**Sum: 211,390 ha 2018**

Mean: 241 ha

Fire Cause

Person = 3,012
Lx = 506
Coastal Fire Centre 1918-2017

Almost 100 years (1918-2017) – split at 50 year mark

>=1967 (after)
Count: 941
Minimum: 0.002831
Maximum: 12,495 ha
Sum: 162,394 ha **Sum: 211,390 ha 2018**
Mean: 172 ha

<1967 (before)
Count: 2577
Minimum: 0.129025
Maximum: 28,972 ha
Sum: 687,191 ha
Mean: 267 ha
Coastal Fire Centre Fire 1918-2018
Coastal Fire Centre Fire History
Components of the Tweedsmuir Complex and Tesla Lake (VA1143, VA1968, VA1887, VA1964, R12315)

Count: 5
Minimum: 19.281352
Maximum: 77,136 ha
Sum: 155,536 ha 2018
Mean: 31,107 ha

Historically – in Tweedsmuir complex area 1918-2017
Count: 35
Minimum: 0.002831
Maximum: 16,123 ha
Sum: 44,325 ha 1918-2017
**Sum: 155,536 ha 2018**
Mean: 1266.457137
What do I think about “Can we prepare the Coast for “new” fire beh’r and climate?”

Talk the talk. Walk the walk.
NFWRx – putting fire out on the land- we light ‘em – we fight ‘em.
Training – everyone gets S100/185
Preparation and appropriate planning
Public education + Extension
Patch-burn Grazing School 2016 - Thiessen Bros Ranch, North Peace

Photo credit: S.E.R. Leverkus
Synergies

- Home Ignition Zone Assessments
- FireSmart
- CWPPs
- Fuel Trt Programs
- ER Programs
- FN/IC Rx Fire Programs (NuXalk, BRFN, PIB, Tsilhqot’in)
- NEBC Rx Fire Council + Rx Fire Associations
- P-L Rx Fire Program + EK Trench
Fire absorbing(ent) landscapes (Fuhlendorf and Leverkus, 2015)
“Future promises more flame – not less” - Pyne

Acknowledge cultural + historical practices
TEK + LEK
And keep moving forward

Photo credit: S.E.R. Leverkus
Thank you
Mussi/Mahsi cho
Wuujo asaana Iaa - Sechanalyagh

Sonja Leverkus
(250) 321.7069
ShiftingMosaicsConsulting@gmail.com
NFWoRx@gmail.com
https://wildfireanalytics.org

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Environment Canada

Canadian Wildlife Services

Villers Air Services

Scoop Lake Outfitters (1997) Ltd.

Wildlife Conservation Society

British Columbia