# Burning Questions: synthesis & extension of existing information on ecosystem responses to fire

**Evelyn Hamilton, Sybille Haeussler, Julia Chandler and Reg Newman, consulting ecologists**

## Introduction

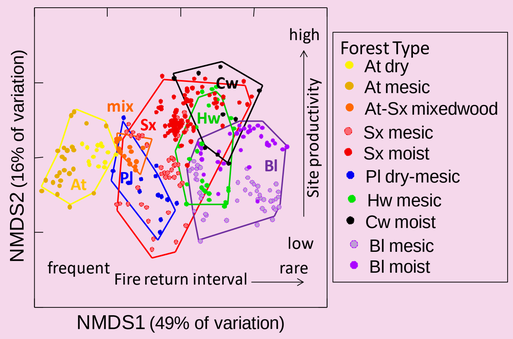
- After recent record fire seasons, the ecological role of fire and risks posed for BC's forests and rangelands are once again top of mind for BC resource managers.
- Researchers have studied effects of wildfire and prescribed fire on fuels, soils, vegetation and tree growth since at least the 1970s, but early databases are at risk of being lost.
- Our project assembles and archives existing datasets examining effects of wildfire and prescribed fire on ecological properties and services to address priority questions identified by BC forest and land managers.

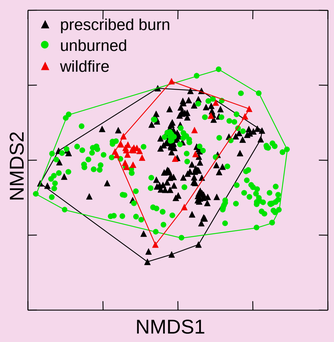
## Methods

- 33 resource managers and fire specialists were interviewed to identify burning questions and data sources.
- 120 datasets describing ecosystem responses to wildfire and prescribed burning were acquired, cleaned and assessed.
- 56 datasets (some monitored ≥20 years post-fire) were deemed suitable for further analyses – focusing on vegetation % cover, recorded at all sites.
- Ordination (NMDS & RDA) identified major plant community trends and subgroups of data for subsequent analyses.
- Mixed effects models were used to examine responses over time.

## The Big Picture

- Plant community composition across 49 central and northern BC sites was most strongly related to fire history and site productivity.




- Differences between recently burned & unburned sites were small (2.5% of total variance).
- **Wildfire** & **prescribed burn** communities mostly overlapped
- They lay almost entirely within the range of variation of **unburned** communities.
- Results confirm the importance of fire in shaping plant communities and indicate generally high resilience to fire.

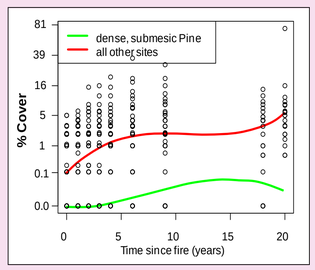
## BURNING QUESTIONS

- How does fire affect ecosystem health & productivity?
- How do edible wild berries and medicinal plants respond to fire?
- How is wildlife (moose, grizzly, caribou) and livestock forage affected by burning?
- Do prescribed burns successfully increase grassland habitat?
- Does fire enhance invasive plants?
- How is tree growth and carbon storage in ecosystems affected by fire?

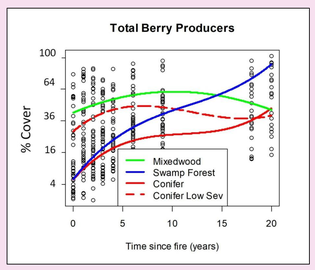
**Managers also asked many questions that could not be addressed with our datasets**

## Northern Interior

### Moose Browse




### Edible Berries



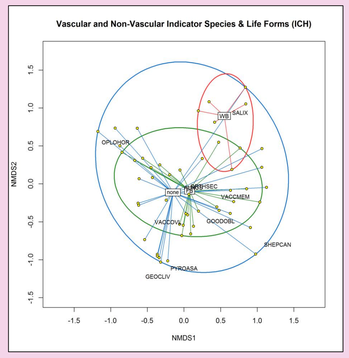

- On the unplanted Swiss wildfire moose winter browse increased rapidly for 7 yr & was still high at 20 yr.
- Planted clearcuts, burned or not, have lost much of their browse by 20 yr due to conifer competition.
- On the Swiss wildfire, berry producers recovered faster on a low severity burn but persisted longer after a severe burn.
- In cutblocks, slashburning will likely enhance berry production only if gaps are left among planted trees.
- Huckleberry recovers slowly on burn pile scars, but they can be excellent sites for early seral species like raspberry & elderberry.

## Dry Southern Interior

- 23 IDF and PP zone burns from Rocky Mountain Trench. 7 had adequate data for detailed analysis.
- Large fuels (>7.5 cm diam.) reduced .09% to 32%. More mineral soil exposed at all sites.
- Douglas-fir in-growth reduced by 53-100%.
- Preferred late seral grasses failed to recover 14-17 years post-fire. Livestock & wildlife grazing likely inhibited plant succession.
- Burning increased invasive plants in the short term. The most commonly increasing spp. on 21 sites were not major noxious weeds.

## Wet Southern Interior

- Devil's-club was sensitive to both wild- and prescribed fire.
- Willow was most abundant on wildfires.
- Reforestation choices may ultimately have more impact on valued berry species such as huckleberries, blueberries & soopollalie than whether or not a site is burned.

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FESBC Forest Enhancement Society of British Columbia

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