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| **Decision makers questions related to the effects of fire on ecosystems and their components** | **Priority of question to decision makers[[1]](#footnote-1) [[2]](#footnote-2)** | **Priority for BQ research team based on importance to decision makers and our ability to address the question[[3]](#footnote-3).** | **Assessment of quality/quantity of relevant BC data[[4]](#footnote-4)** |
| **1. What are the general effects of fire on ecosystems?** | H | M – general question, most specific questions are outside our project scope | Limited |
| 1.1. General ecosystem health, biodiversity and resilience (restoration). | M | M – Aspects of effects on ecosystem health and resilience can be determined. | Limited |
| 1.2 Watershed integrity (site stability, erosion, rates of revegetation - esp riparian) | H for S (Cariboo) | L - No known monitoring studies done in BC riparian areas. Likely literature on this topic, especially from elsewhere | Poor |
| 1.3. Landscape flammability (does prescribed burning reduce risks of wildfires?) | H for S | L - May be able to contribute data to a larger analysis (i.e. data on fuel and duff consumption, vegetation regrowth post burn). | Unknown |
| **2. What are the effects of wildfires (esp. severe fires) wrt reforestation and GY (e.g. Pl after severe wildfires, Df at N limits, Pa, CwHw, low value forests, SI restoration[[5]](#footnote-5))** | M – H in S (Cariboo wrt Pl) | M – better addressed in a different study | Fair |
| **3. What are effect of fire in terms of restoring ecosystems?** | M/H for S | H- for S | Some |
| 3.1 How pre-burn canopy condition (patchy vs uniform) affect outcomes | M for S | L – little data available | Poor |
| 3.2 Effects of season of treatment (i.e. slashing, burning on outcomes (i.e. desirable species, conifers)? | M for S | L – little data available | Poor |
| **3. What are effects of fire on understory plants?** | H | H – Some data and quite a bit of literature available (esp from USA), team has considerable expertise and ability to address the question | Moderate |
| 3.1. Animal habitat/forage | H | H – Some aspects are more readily addressed | Moderate |
| *3.1.1. Caribou ground lichens* | H for N | M- Some work underway on this (SH) in NI. | Good/  Limited |
| *3.1.2 Wildlife ungulate forage (moose browse shrubs, aspen, grass)* | H for N | H- Can look at ST trends for some aspects, limited LT data | Good/Some |
| *3.1.3 Grizzly bear forage[[6]](#footnote-6) (spring food, berries)* | H for N | M- very limited data on berry production, some literature esp from US | ?/Some |
| 3*.1.4 Livestock forage (grasses)[[7]](#footnote-7)* | H – esp. for S | H for S - Some data for S from restoration burns, lots of literature | Variable/some |
| 3.2 Culturally important (FN food, medicine, berries[[8]](#footnote-8)), bear, birds) | M | M – we have limited knowledge of what FN food & medicinal plants are and very little info on fire effects (some for devil’s club, berry producers) | Good/ |
| *3.2.1 Berry producers/berries* | M | H -Some ST data on impact on berry producers, little on LT and burn severity effects. Very limited data on production. | Good (ST for plants)/  Poor (for berries) |
| 3.3. Plant species at risk | M | M- Few BC studies of effects of fire on these species, some literature | Poor/ |
| 3.4 Non-native/invasive plants | H for S restoration burns | M - high site to site variance. Best done based on lumping into “invasive mechanism” groups. | Moderate/Poor |
| 3.5 Alternative hosts for pine rusts (i.e. *Ribes*) | M | M – some info on effects of fire on *Ribes* species | Some |
| 3.5 Plant species diversity | M/L | M - Difficult to compare studies with differing sampling intensities. | Poor |
| **4. Climate change – what are likely fire effects in the future and how will they change?** | M | L - Not a data analysis question – predictive modelling needed | ? |
| **5. Carbon, GHG and smoke[[9]](#footnote-9) [[10]](#footnote-10)** | H for S (esp. smoke in some areas) | L - large topic, mostly out of scope except that information on rates of revegetation post burn can inform predictive models | ? |
| **6. OGMAs – what values do burned OGMAs have?** | M for N | L – no known data sources | poor |
| **7. What prescribed burning practices are feasible given the current state of the forest (i.e dead trees, heavy fuel loads)?** | M for S | L – no known data sources | poor |

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Information needs identified by decision makers with responsibilities at the provincial level and South Region** | | | | | | How does prescribed fire prevent or mitigate the impact of wildfires? | | |  |  | | How does fire improve damaged or low value forest? | |  |  |  | | How does prescribed or wildfire improve habitat for wildlife? | |  | | | | | How does prescribed or wildfire support the use of fiber from damaged and low value forests? | | | | | | How does prescribed or wildfire improve the management of greenhouse gas emissions from forestland? | | | | | | | What are the effects of fire on ecosystems and on the restoration of degraded ecosystems? | | | | | | How does prescribed fire interact with livestock and wildlife use of burned areas to influence reforestation? | | | | | | | What are long term impacts of prescribed burns? |  |  |  |  | | Will burning in cedar-hemlock forests enhance subsequent productivity for tree growth? | | | | | | Does prescribed fire enhance tree growth thereby increasing carbon sequestration? Overall effect on GHG? | | | | | |   What is the effect of fire on invasive species? Will herbicides before burning reduce invasive plants? | | | | | | | | |
| How does use of fire affect smoke management, air quality? | | | | |  |  |  |
| How does prescribed fire affect flammability of plantations? | | | | |  |  |  |
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| Effect of fire on site stability, erosion? | | |  |  |  |  |  |
| How does fire severity affect berry production - short term response versus longer term productivity? | | | | | | | | |
| How does pre-burn condition affect prescribed fire outcomes? | | | | |  |  |  |
| Can we set better targets for prescribed fire predictions? | | | | |  |  |  |
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| **Information needs identified by decision makers in the North and Central parts of the province.** | | | | | | |  |
| Rates of recovery of watersheds after fires | | | |  |  |  |  |
| Implications of severe fires on future reforestation | | | |  |  |  |  |
| How to incorporate ecosystem restoration into wildfire burned areas to restore priority ecosystems | | | | | | | | |
| Moose and spring bear forage development following wildfire | | | | |  |  |  |
| Does burning enhance or inhibit trembling aspen encroachment/recovery? | | | | | |  |  |
| Does wildfire reduce lodgepole pine stem rusts or the alternate host species for lodgepole pine stem rusts? | | | | | | | | |
| Restoration of Douglas-fir at its northern limits - does fire enhance or inhibit Douglas-fir regeneration? | | | | | | | | |
| Whitebark pine recovery: how does fire damage and/or enhance whitebark pine ecosystems? | | | | | | | |
| Restoration of berry patches using fire | | |  |  |  |  |  |

1. Based on our interviews with 33 provincial decision makers and other research;, L-low, M-medium, H-high [↑](#footnote-ref-1)
2. S- South Region, N -North Region, [↑](#footnote-ref-2)
3. Assessment by research team’s ability to address the questions based on availability and quality of data and our expertise, time and resources. [↑](#footnote-ref-3)
4. Assessment by research team of the quality and quantity of available data [↑](#footnote-ref-4)
5. How does prescribed fire interact with livestock and wildlife use of burned areas to influence reforestation? [↑](#footnote-ref-5)
6. Important grizzly bear forage species include *Hedysarum, Shepardia* and *Vaccinium*. [↑](#footnote-ref-6)
7. How does pre-burn treatment (e.g. slashing, herbicide, grazing) and consequent condition (i.e. mineral soil, soil compaction, non-native/invasive plants) - influence response of sites to burning, including establishment and growth of non-native/invasive species? [↑](#footnote-ref-7)
8. First Nations culturally important plants include huckleberry, soapberry and devil’s club. [↑](#footnote-ref-8)
9. Can prescribed fire enhance tree growth thereby increasing carbon sequestration and offsetting GHG emissions from burning? [↑](#footnote-ref-9)
10. How does use of fire affect air quality? [↑](#footnote-ref-10)