Hollingsworth T. N., A. L.. Breen, R. E. Hewitt, and M. C. Mack. Does fire accelerate shrub expansion in Arctic Alaska tundra? Examining the complex effect of fire history on vegetation and ecosystem dynamics on the Seward Peninsula. Submitted to *Arctic, Antarctic, and Alpine Research*

## Supplemental Table 1: Tundra burn severity classification.

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| --- | --- | --- |
| High Severity | Moderate Severity | Low Severity |
| **Substrate** |
| * Deep consumption of organic layers (duff) indicated by spots of mineral soil exposure or burned off shrub stems
* Remaining tussocks columnar, with > 60% of basal area consumed; any leaves present are new since the burn (no old litter remaining)
* Mineral soil covered by ash or liverwort/fire moss covering >20% area
* In tussock tundra, lines of white ash between hummocks or polygons
 | * Most of surface is charred, rough black with intermediate consumption of duff
* 0-20% mineral soil exposure indicated by ash, liverwort, or fallen tall shrubs
* Tussocks somewhat peaked, with moderate (20-60%) consumption of basal area; little or no pre-burn leaf litter evident.
 | * Scorch surface with little consumption of duff
* Frequent patchy Sphagnum mounds or moist depressions giving discontinuous surface burn
* Vigorous re-sprouting of cottongrass tussocks or of shrub layer
* Tussocks round, with moderate old leaf litter, <20% of basal area consumed
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| **Vegetation** |
| * >50% tall shrubs fallen indicating roots burned completely or duff burned completely
* Near 100% tall shrub/tree and low/dwarf shrub canopy mortality
* Branches may be burned off tall shrubs
* Fallen dead tall shrub stems may be consumed in rare cases leaving lines of white ash
* In tussock tundra, indications of substantial consumption and mortality of tussock bases (no resprout, no yellow on top)
 | * May be some large shrubs fallen but >20% of area shows charred or live shrub vegetation remaining on surface
* In permafrost areas, >20% of shrubs will still be standing
* Often old yellowed leaves or twigs remain on some of the standing shrub skeletons
* Twigs will remain on shrubs like Labrador tea, but most leaves are consumed
* Riparian corridors and wet depressions usually unburned or light scorch
 | * Some live unburned shrubs remaining
* Canopy with some green leaves remaining
* Riparian corridors unburned
* Discontinuous burn
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Note: \*Substrate outweighs vegetation if indicators conflict.