Wildlife-Veg-Fire Breakout Session

Discussed 3 synthesis ideas:

1. Vulnerability of wildlife to changes and variation in phenology
2. Reciprocal feedbacks between wildlife and fire
3. Integrating animals into carbon cycle models
    - Decided that wildlife group could not take lead on this but would be happy to discuss with carbon group if they are interested in leading

Multiple dimensions of phenology

- Climatic: Temp, snow cover dynamics, river ice, rain-on-snow
- Vegetation: leaf-on, leaf-off (Woodcock/Friedl, phenocam network)
- Insect availability/activity (e.g., mosquito)

- Importance of increasing interannual variability vs shifting means

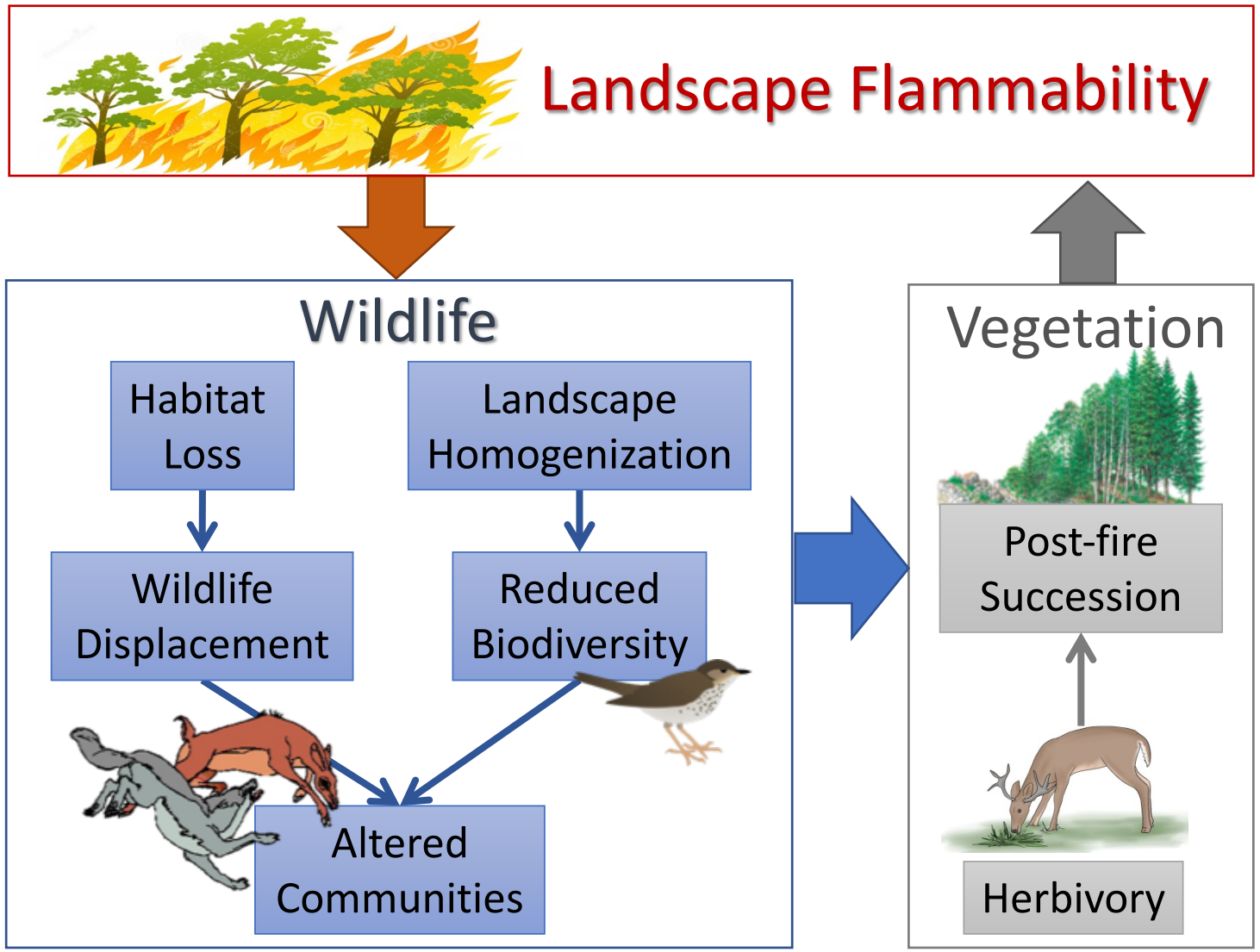
Multiple dimensions of vulnerability

- Movements (migration timing and routes, rates, energetics)
- Reproduction (timing and success)
- Mortality, survival (predator-prey interactions)

- Implications for people (i.e hunting, wildlife viewing) – who are the winners and losers? (Brinkman)
  - Need finer temporal resolution spatial product of fall leaf-off dates (~daily)
  - Water levels/connectivity—fine spatial grain
  - Moose movement shifts in fall

- Broader synthesis may be premature at this point and more impactful after better understanding for different focal species

Wildlife-fire Reciprocal Feedbacks



Wildlife-fire feedbacks

- Wildlife provide provisioning and cultural ecosystem services
- Wildlife may also have strong effect on regulating & supporting ecosystem services (vegetation dynamics and disturbance regimes)
- Bonanza Creek: lots of work on moose, hare herbivory, fire (Ruess)
- Lots of different components quantified for different species, but not synthesized or examined at broad scales
- Caribou and tundra fires—does fire affect their movements?
- Is there a relationship between moose or caribou density and post-fire NDVI, deciduous:conifer ratio, or lichen biomass?
- Might be more straightforward for tundra than boreal forest, also good caribou movement data

Hank's question: what have we learned so far about resilience and vulnerability?

- **Scale-dependent snow properties**: depth and density affect fine-scale animal movement, coarse-scale properties affect demography and migrations (Prugh)
  - *Vulnerability varies with latitude*: Dall sheep populations 2x more sensitive to spring snow conditions at northern part of their range
- Species-specific differences in **flexibility to changes in seasonality**, providing insights into how each animal species will respond to future change (Boelman)
  - *Vulnerability varies by age class*: adult golden eagles less flexible in migrations than subadults
- Water levels and erosion having been identified as factors that have the largest impact on **rural community travel and access** to ecosystem services (Brinkman)
- High resolution maps revealing current distribution/recent **loss of permafrost-related terrain features** critical for many coastal communities (Frost)