Whitebark Pine Status in Northwestern Montana & the Pacific Northwest

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Forest Inventory & Analysis Program

Whitebark Pine Ecosystem Foundation, Pablo, MT, 2019

Objective

To assess indicators of whitebark pine (WBP) at multiple spatial scales:

1. Areal extent
2. Number of trees (live and dead, by size)
3. Seedling abundance and density
4. Growth versus mortality rates

Forest Inventory & Analysis (FIA):

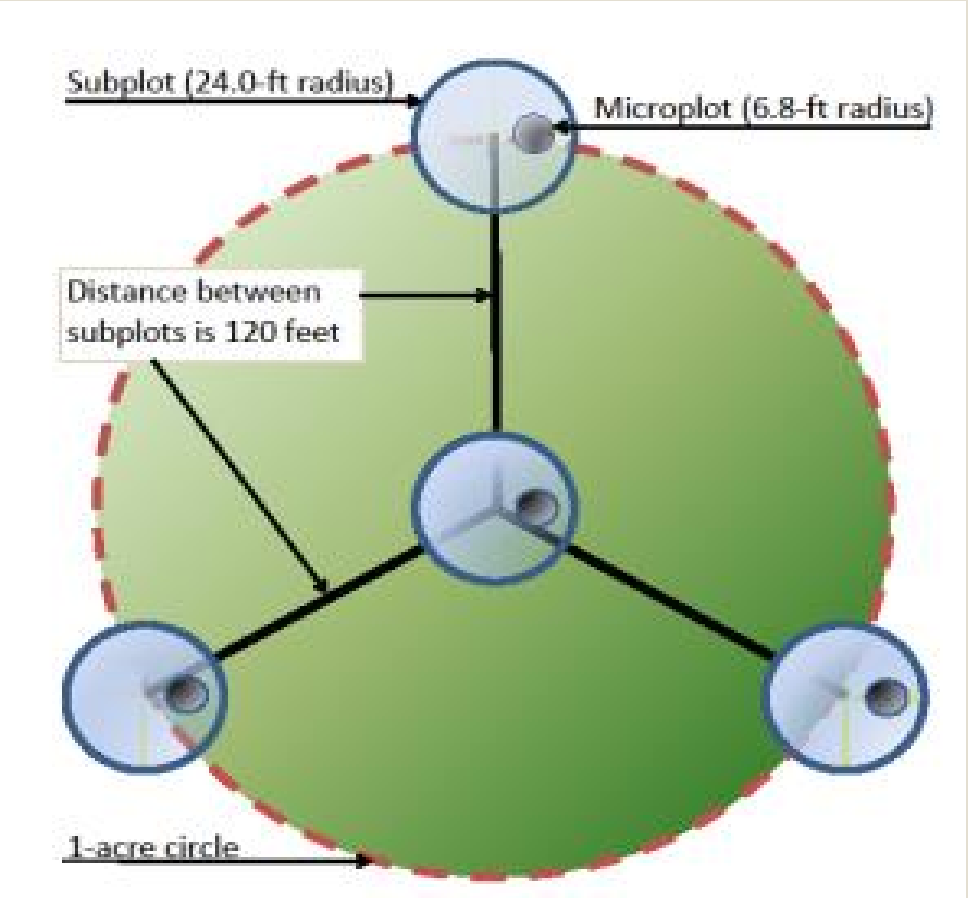
Sample design

- Probabilistic sample
- Spatially and temporally balanced plot network
  - 1 plot every ~6,000 acres
  - 10-year re-measurement cycle
- Designed for estimating attributes (and errors) across broad scales
- All forest types and ownerships
- Rigorous quality control and assessment
- Data available online: http://apps.fs.usda.gov/fia/datamart/damart.html (or search: *FIA DataMart*)

FIA plot design

4 fixed-radius subplots:

- 120′ subplot spacing
- Trees (≥5.0″ dbh)
- Understory vegetation



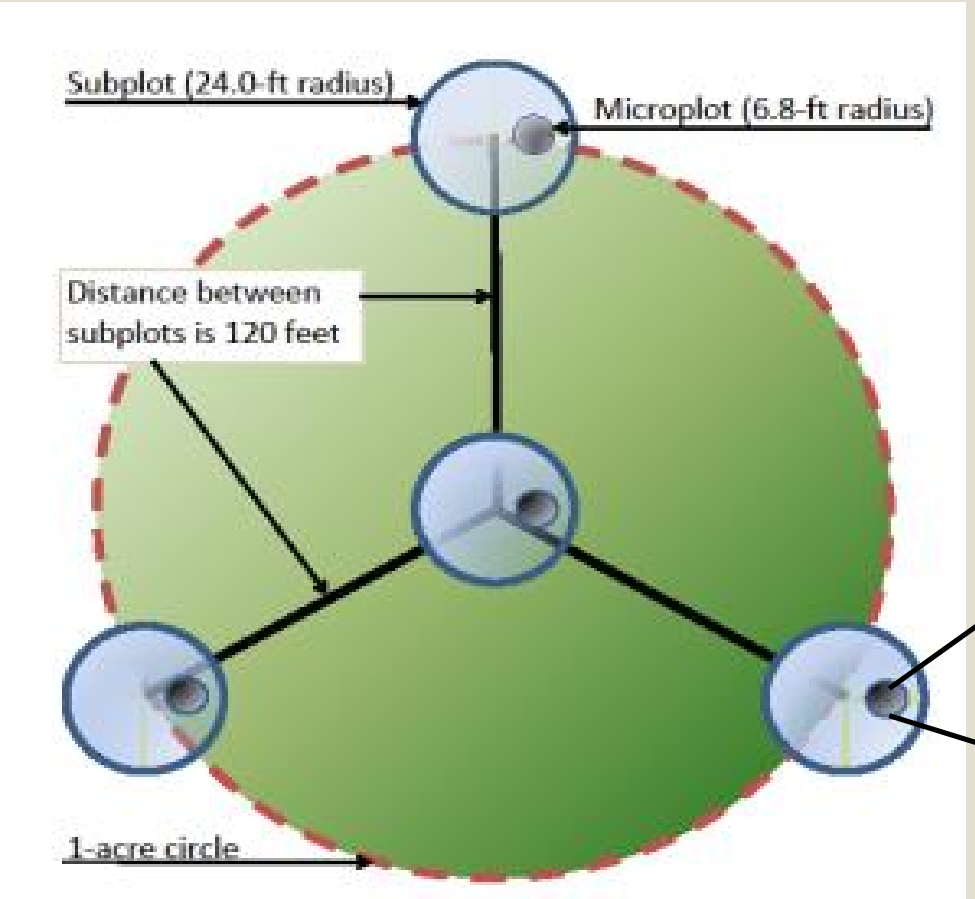
FIA plot design

4 fixed-radius subplots:

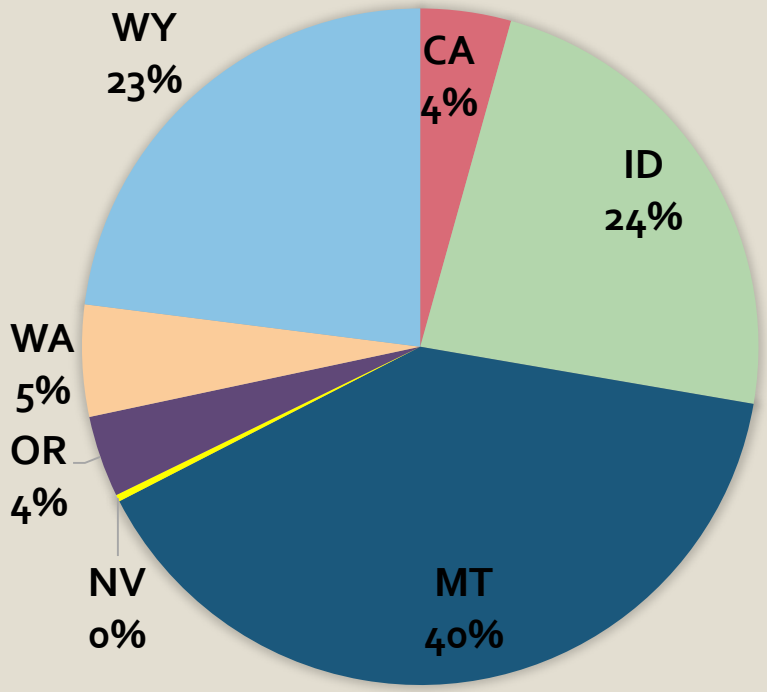
- 120′ subplot spacing
- Trees (≥5.0″ dbh)
- Understory vegetation

4 fixed-radius microplots:

- Saplings (dbh 1.0″-4.9″)
- Seedlings (≥6″ tall)



Areal extent of WBP

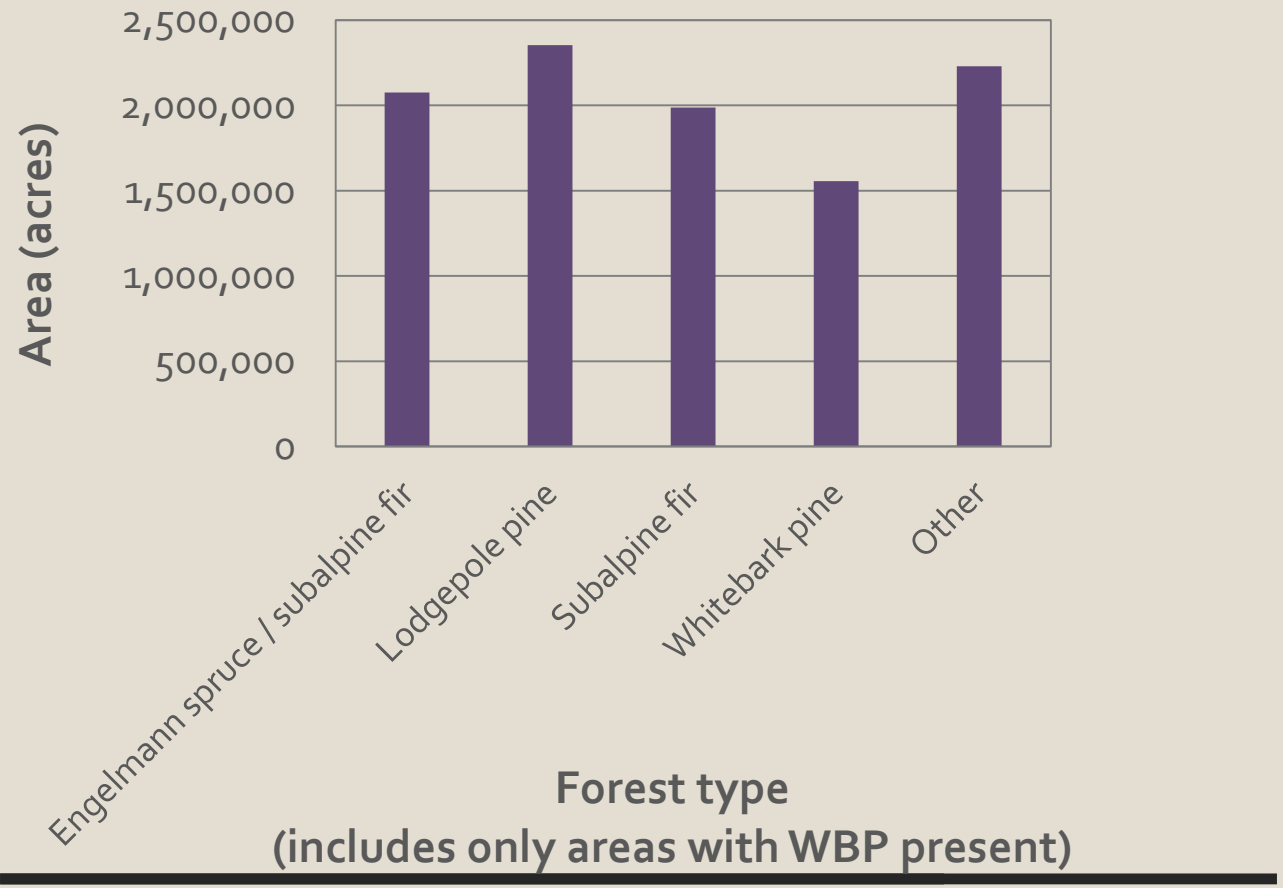


Whitebark pine (WBP) occurs on **10.2 million acres** across the western US.

By state:

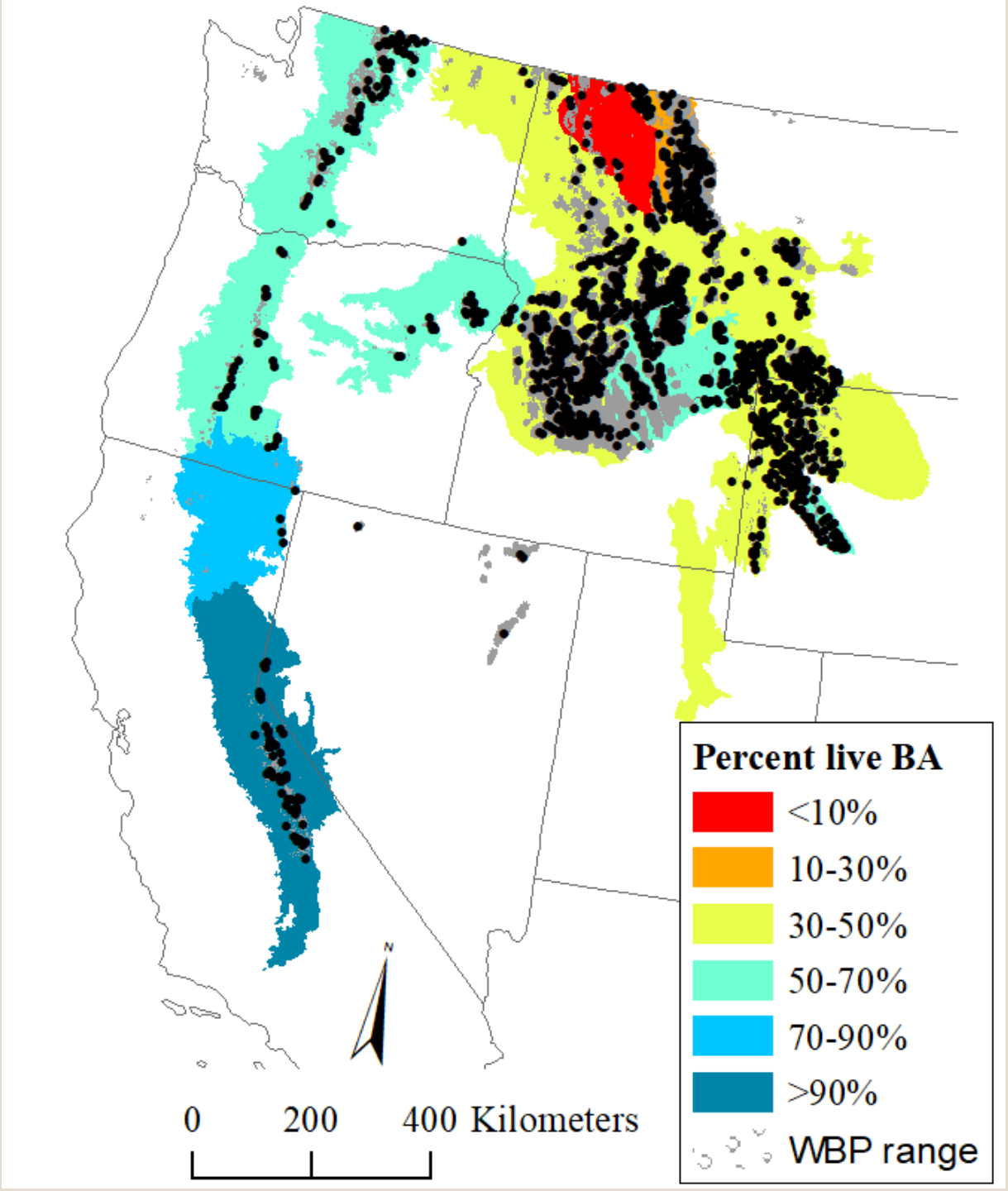
- 40% of area with WBP is within Montana.
- 32% is in the Pacific Northwest outside Montana, most of which is in Idaho.

Areal extent of WBP



WBP presence by forest type and state:

- WBP occurs most often in stands dominated by lodgepole pine, subalpine fir, or spruce-fir.
- Pacific Northwest: most often in minor forest types (OR/WA) or in subalpine fir stands (ID).
- MT and WY: WBP is most often in spruce/fir and lodgepole pine stands.



Percent of WBP that is alive

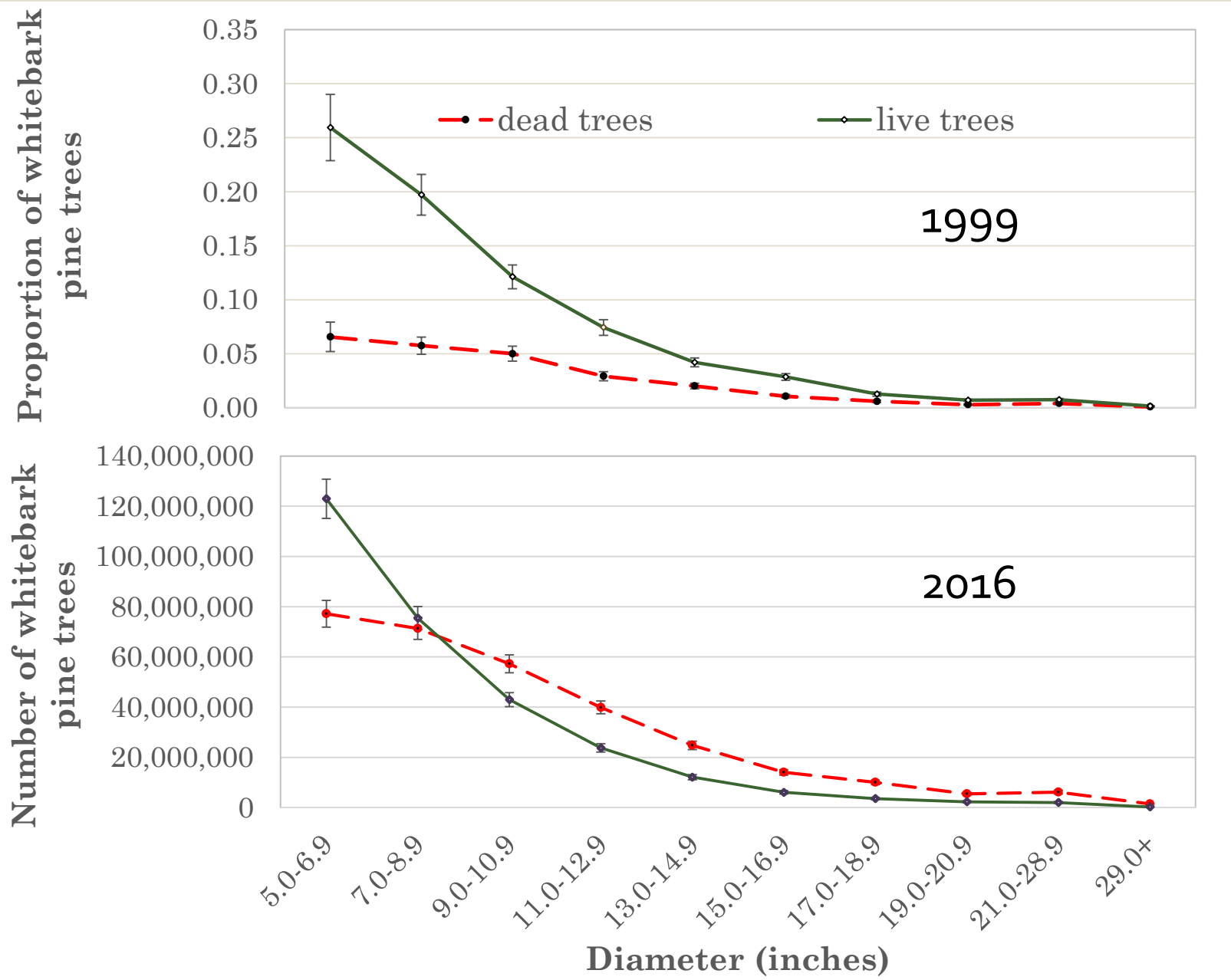
There are currently >600 million standing WBP trees in the western US.

52% of these are dead.

Goeking & Izlar 2018

Number of WBP trees:

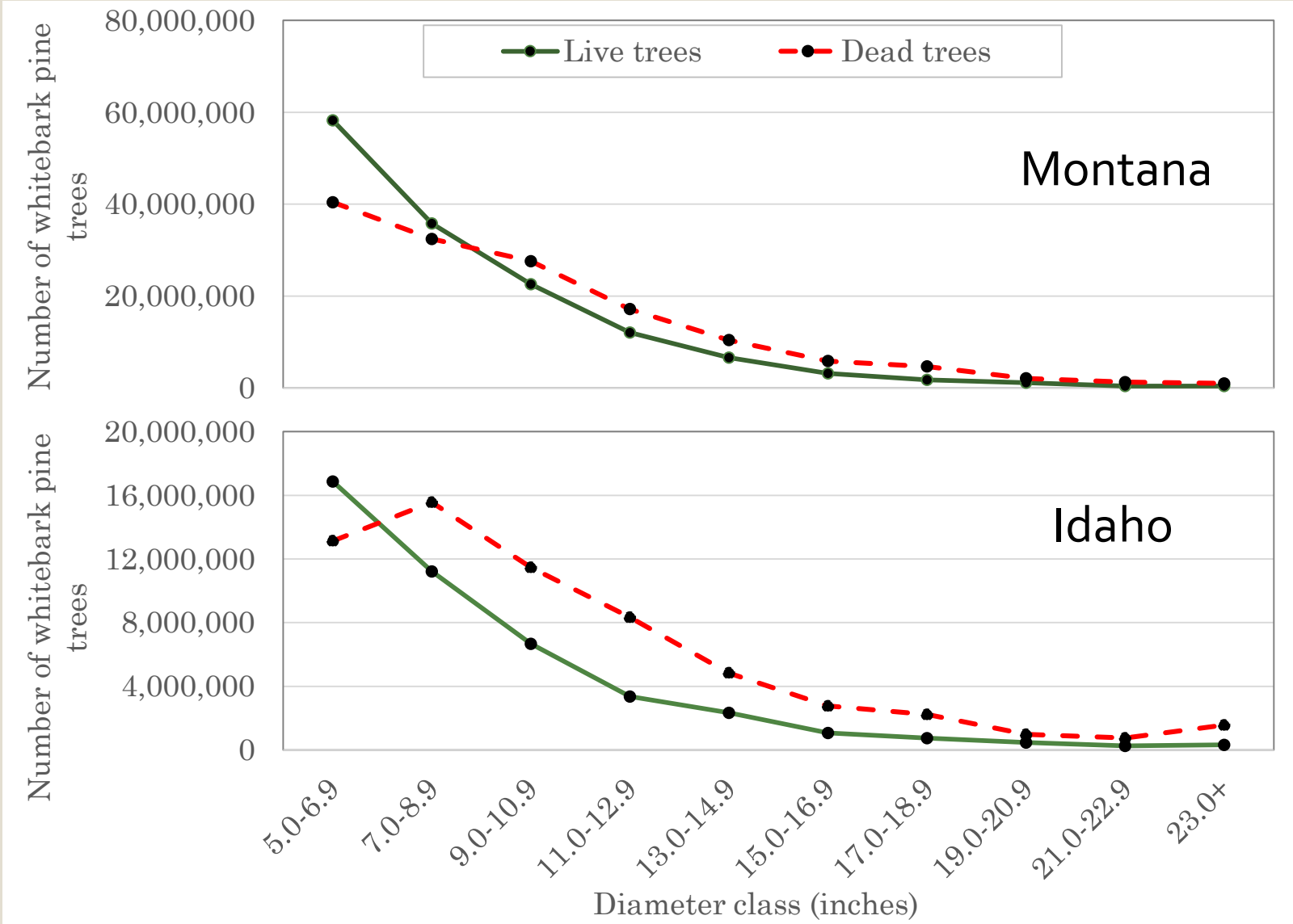
West-wide context



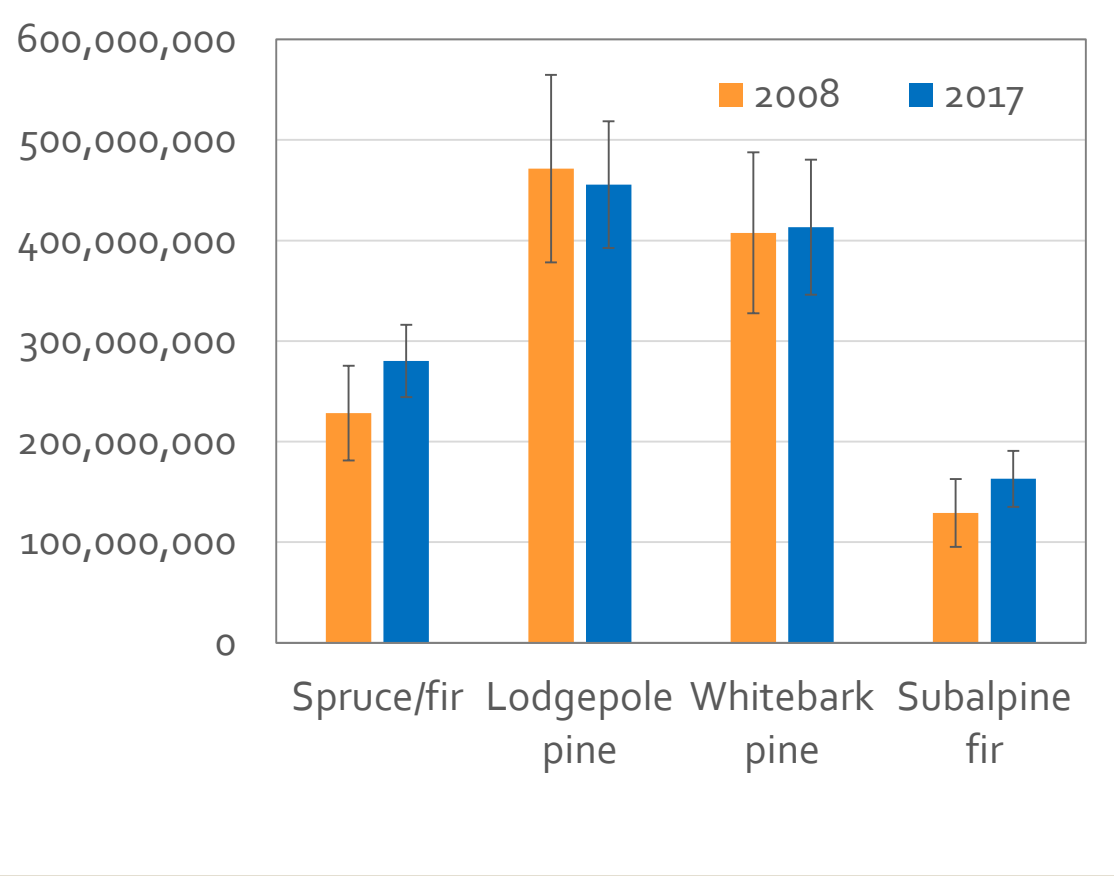
Goeking & Izlar 2018

Number of WBP trees:

Montana (2017) & Idaho (2018)

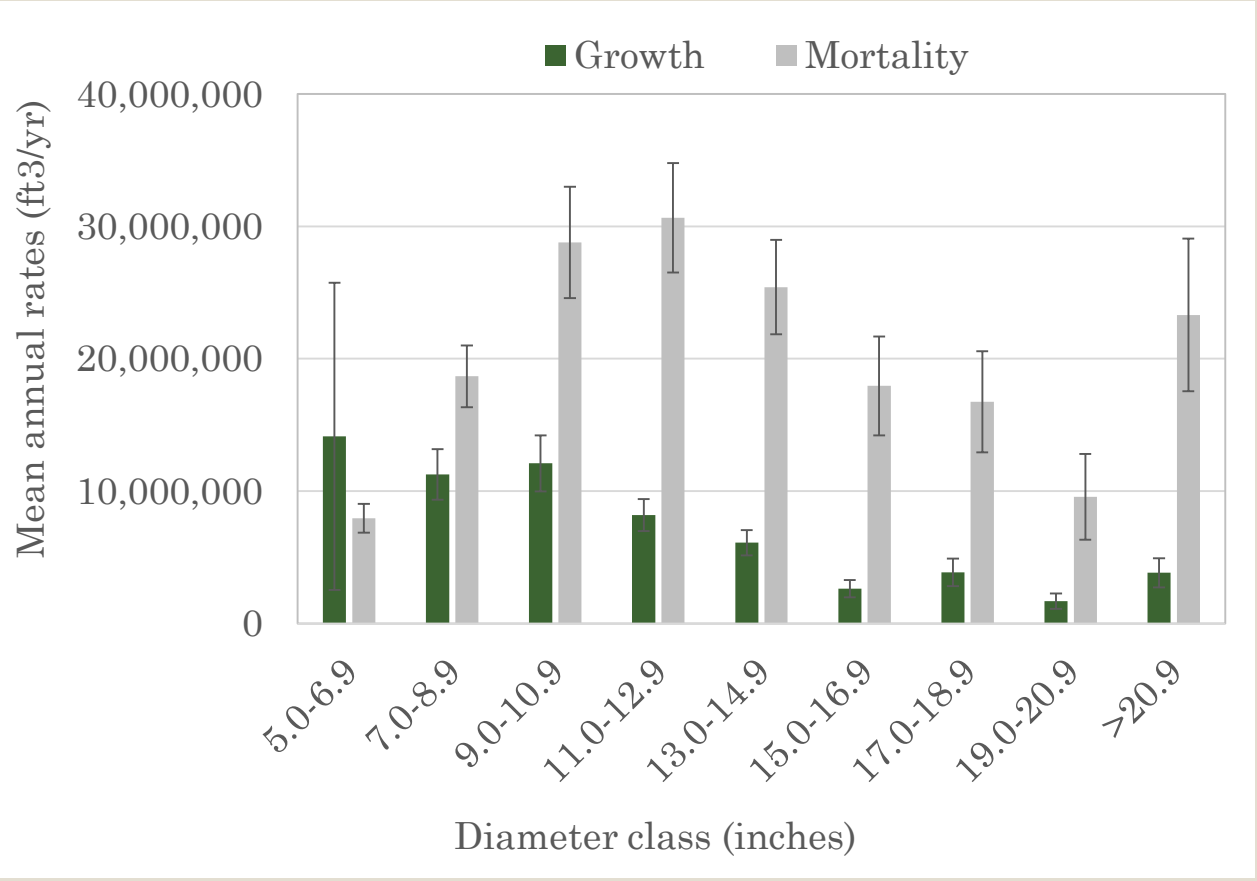


Seedling abundance, by forest type



WBP growth & mortality:

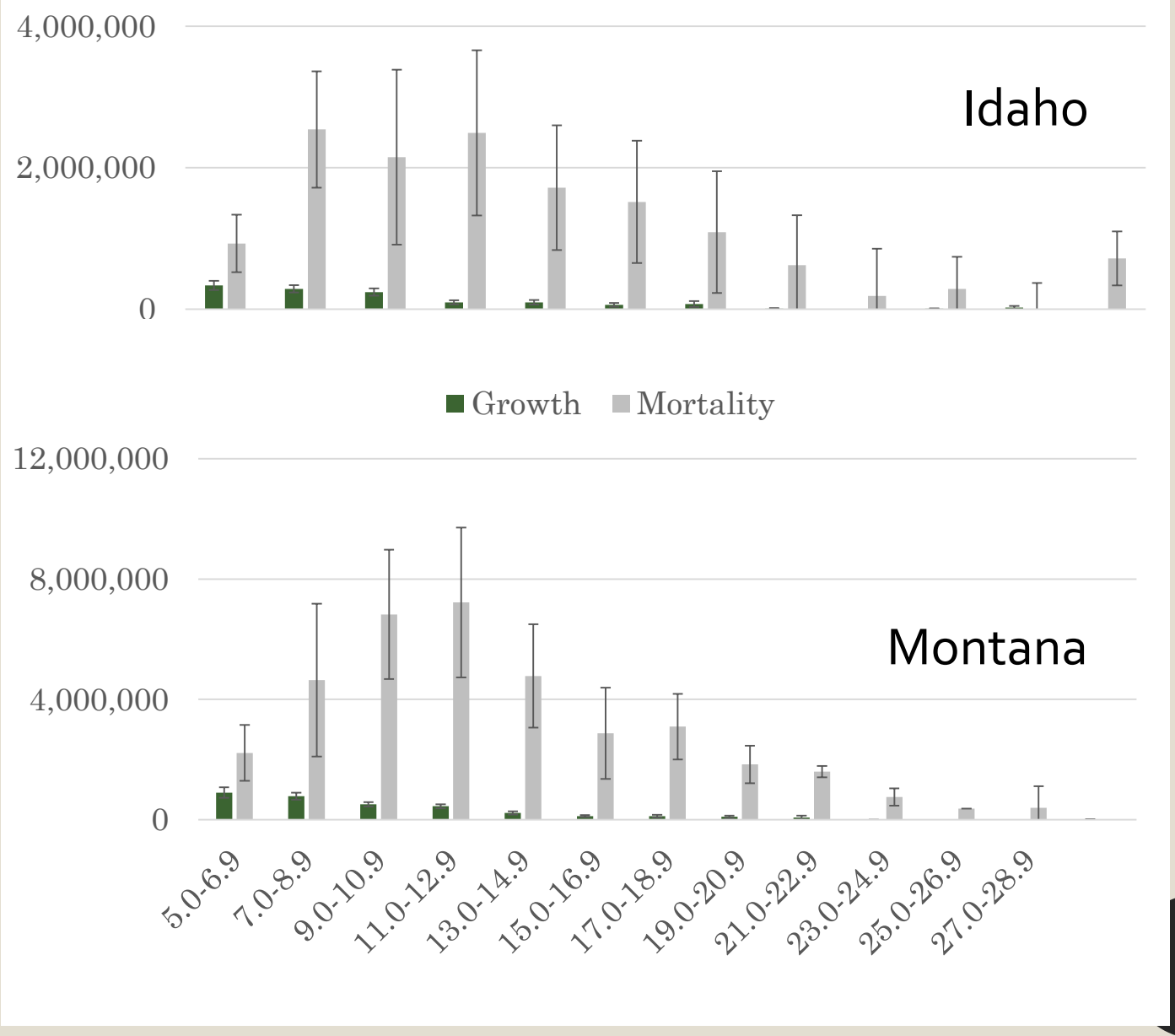
West-wide context



Goeking & Izlar 2018

WBP growth & mortality:

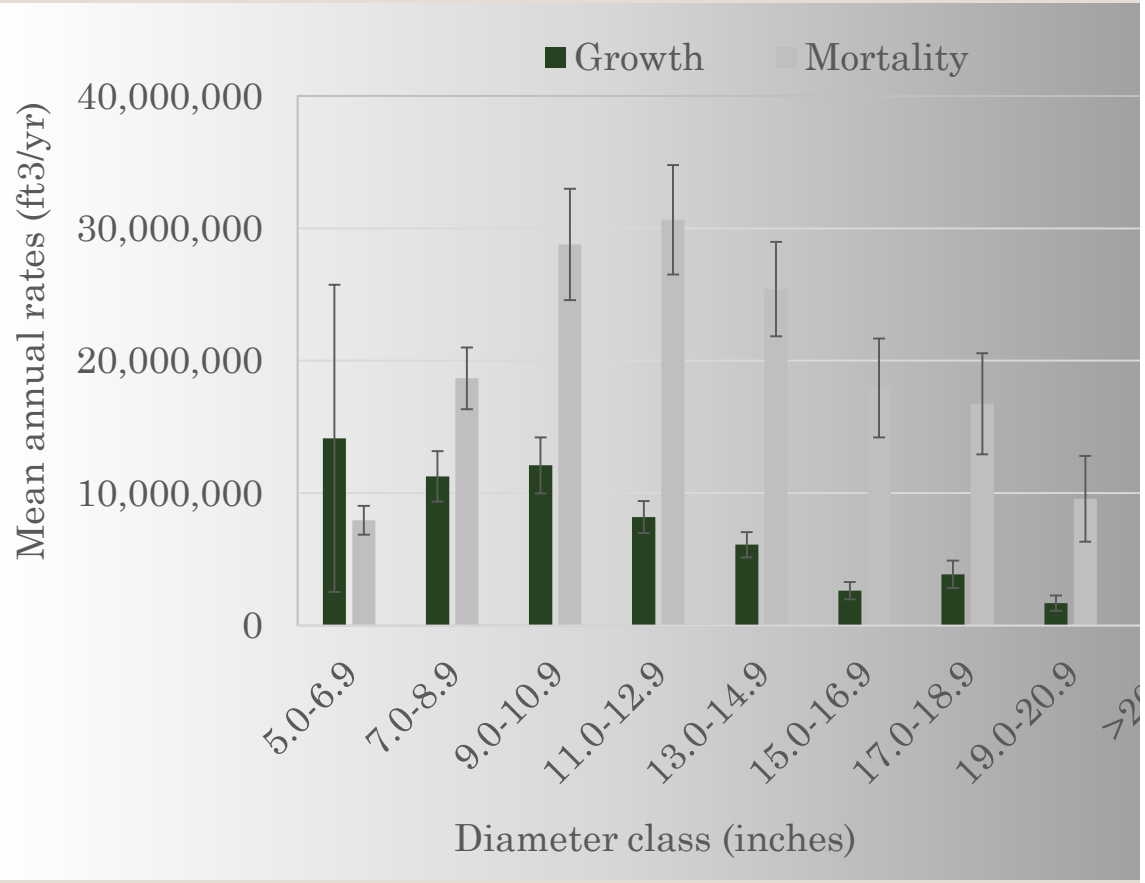
Idaho & Montana

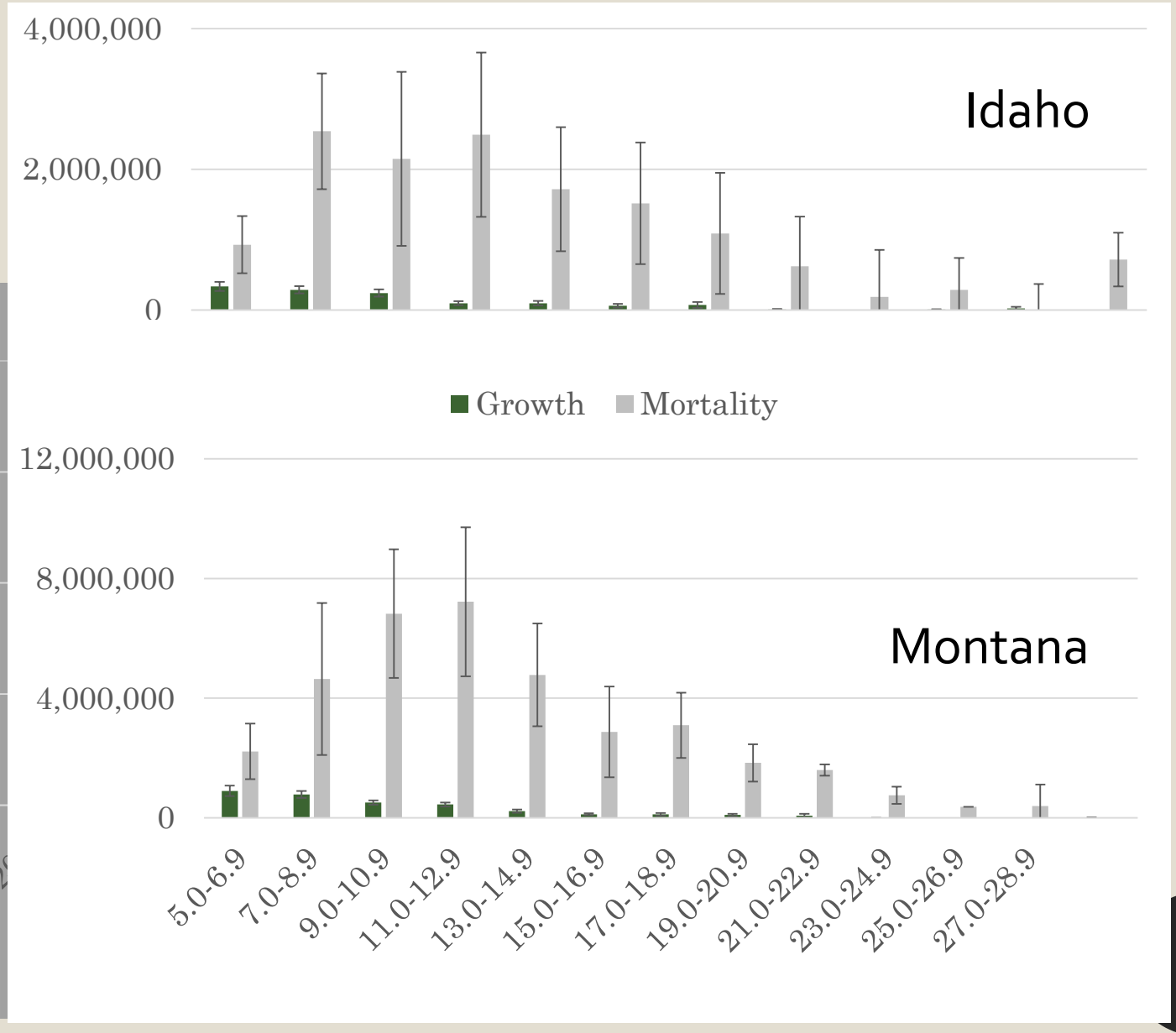


Diameter class (inches)

WBP growth & mortality:

Idaho & Montana

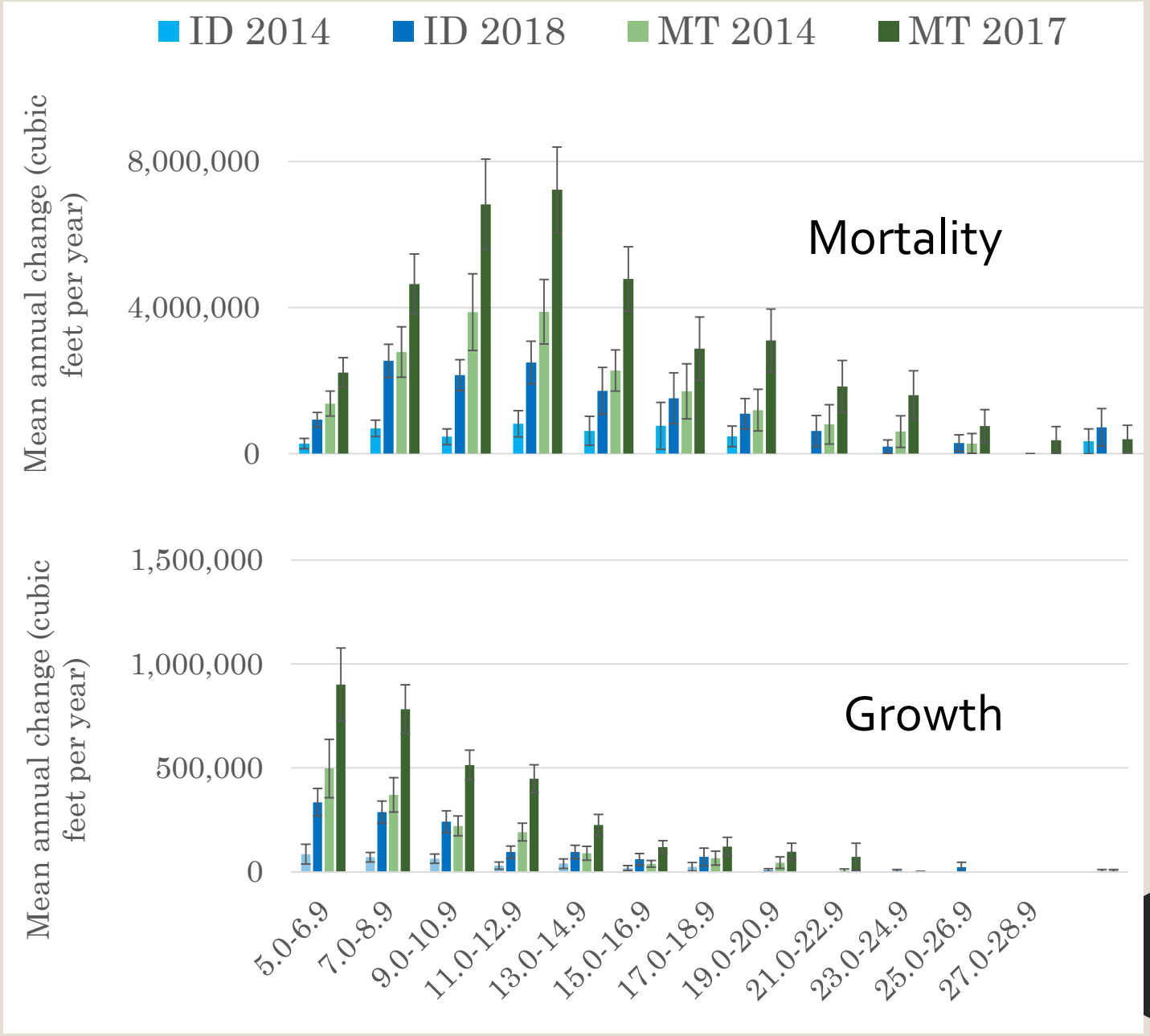




WBP growth & mortality:

Montana, 2014 & 2017

Idaho, 2014 & 2018



Conclusions

- Most of the area with WBP, and most WBP trees (including seedlings), occur in forest types dominated by other species.
- The trend toward increasing proportion of dead vs. live trees continues.
- Idaho and Montana:
  - Mortality continues to exceed growth and has increased significantly over the past 3-4 years, for all size classes.
  - Live tree growth also increased significantly during the past 3-4 years, for most size classes.
  - Seedling density has not changed significantly.

Contact:

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For more info:

Goeking and Izlar 2018: Forests

Goeking et al. 2019: Forest Science

Witt et al. 2018: Idaho's Forest Resources (RMRS-RB-29)

DeRose et al. 2018: Wyoming's Forest Resources (RMRS-RB-28)

Witt et al. (in press): Montana's Forest Resources (RMRS-RB-##)

Online story map: *Vital Signs of a Species in Decline*