Shared Stewardship in Idaho

A report compiled by the Forest Service Rocky Mountain Research Station Scenario Planning Team.

Chapter 1: Shared Stewardship – Northern Idaho

Updated: June 14, 2019

Summary

This document contains a prototype analysis of priorities and potential outcomes for shared stewardship projects in northern Idaho. The analysis is based on published Forest Service and State assessments. The broad intent is to identify how priorities established in assessments can be used to align State activities with state and national or regional goals.

NOTE: The outputs and maps in this report are draft until more detailed land allocation maps are obtained from the Forest Plans in the Region, and the harvest prescriptions are refined to local conditions. These data were not made available to the authors in time for simulations. The information in the report will change after more detailed input data are obtained. The current maps of available area was created using spatial layers from the Forest Service Enterprise Data Warehouse. Other data were obtained from state databases obtained from Idaho Department of Lands.

Harvest calculations do not include insect and other mortality from 2015-2018. The area affected by these disturbances is substantial. Live timber volume was derived from FIA tree lists and assigned across the region using data from LANDFIRE 2014.

I. Assessment of current conditions and opportunities

Land tenures were delineated in the northern Idaho shared stewardship study area based on the Protected Areas Database (USGS), Forest Service administrative lands and state private industrial designations (Fig. 1), and assessed for areas that are suitable for treatment on US Forest Service managed lands by removing wilderness, designated use limitations, and roadless areas. Project areas were delineated based on Idaho Department of Lands staff following HUC12 subwatershed boundaries (Fig. 2).

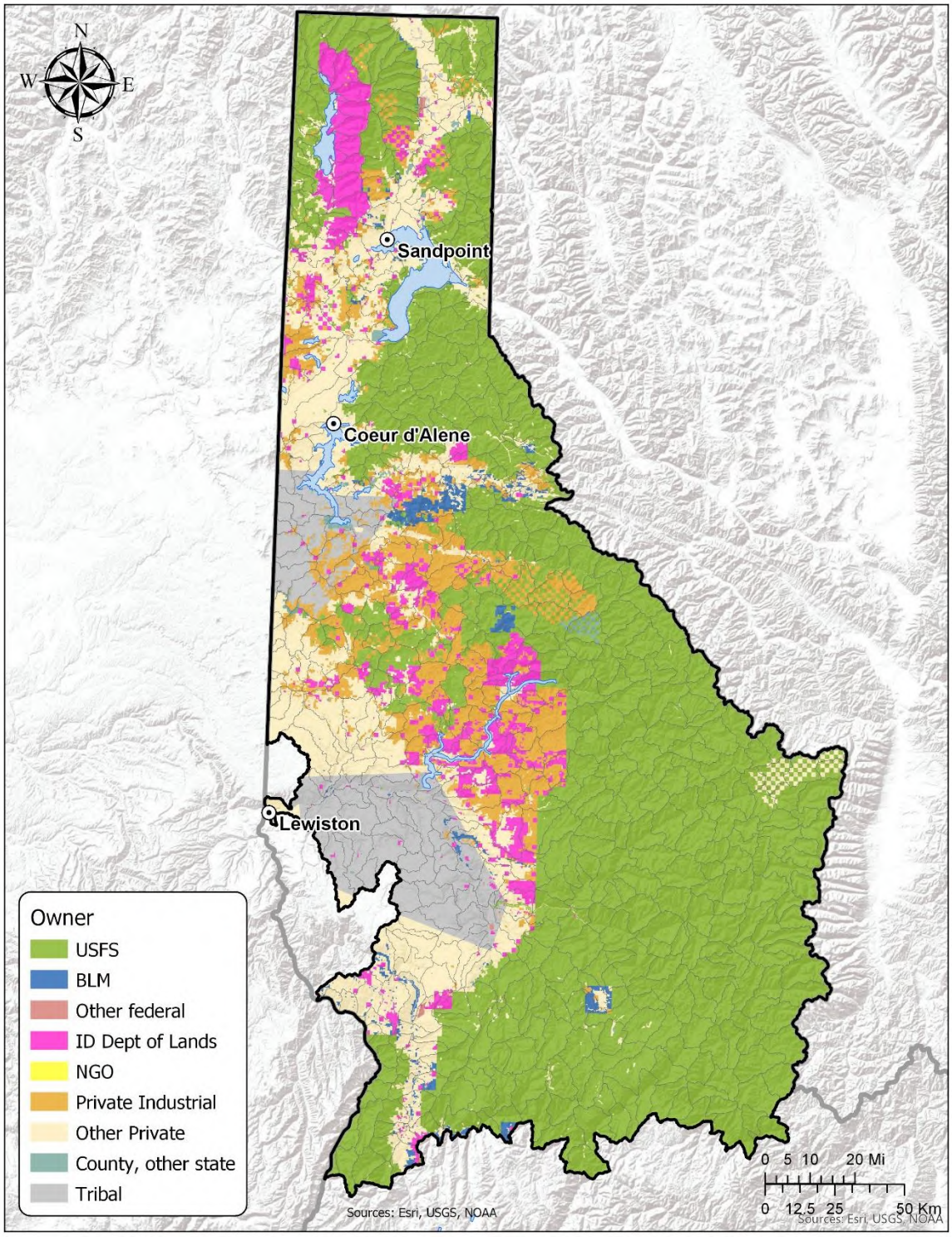


Figure 1. Land tenures in the northern Idaho shared stewardship study area. See figure 2 for USFS protected lands including wilderness and roadless areas. BLM = Bureau of Land Management; NGO = non-governmental organization

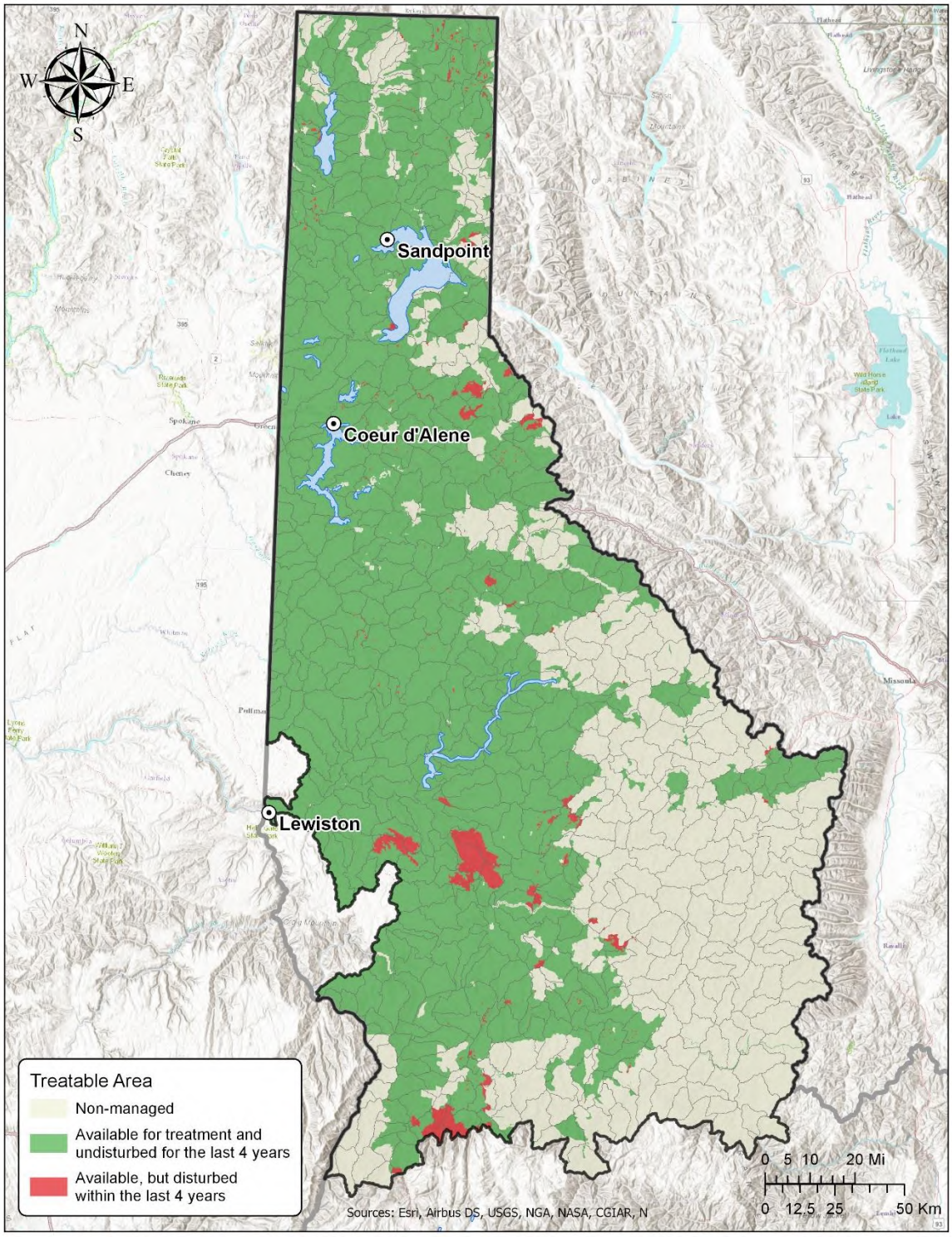


Figure 2. Areas available for treatment and disturbed in the last four years (2015-2018) in the northern Idaho study area. Lands available for treatment exclude roadless, wilderness and national designated areas on USFS lands.

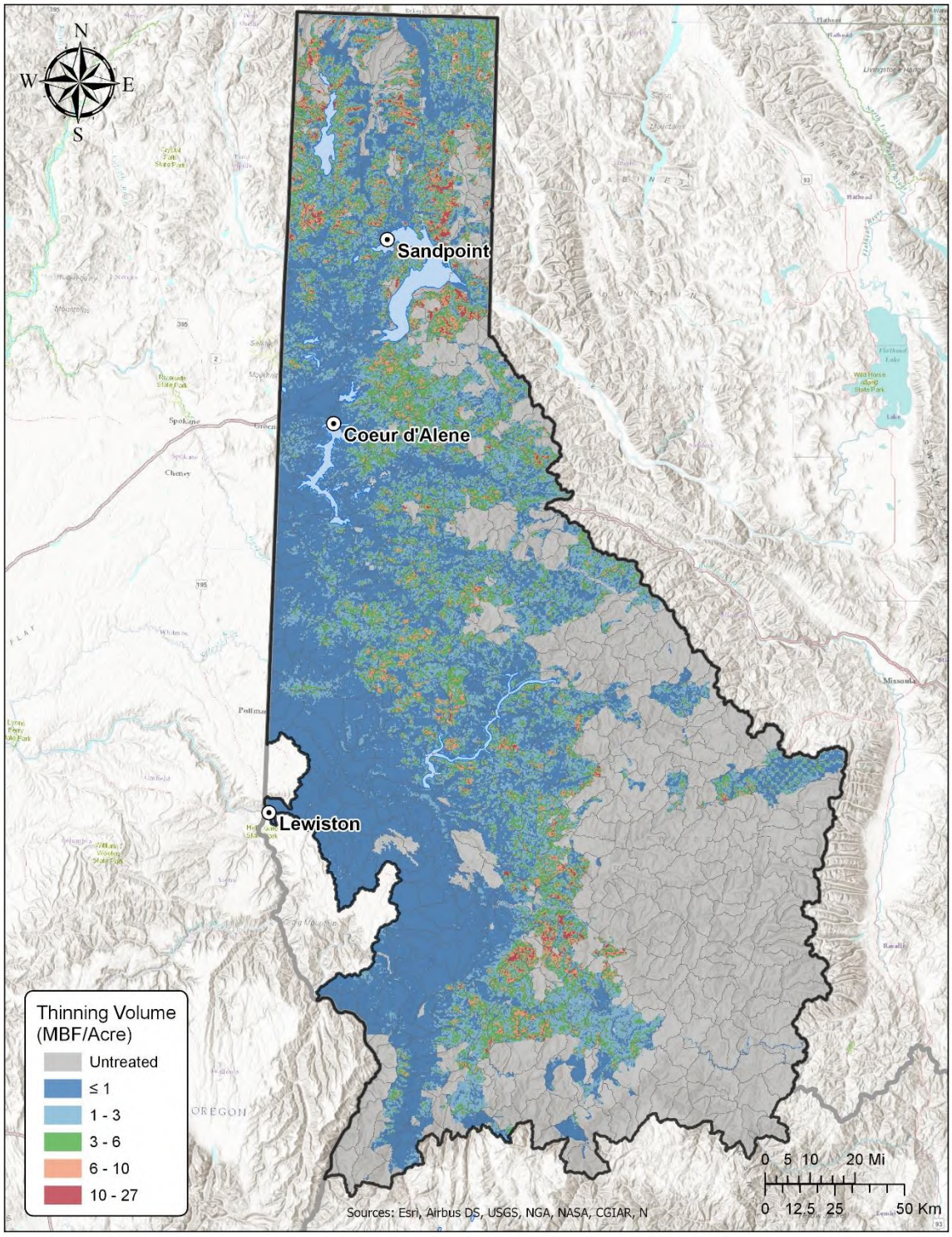


Figure 3. Merchantable live timber volume in areas available for mechanical treatment (excludes USFS wilderness and roadless areas).

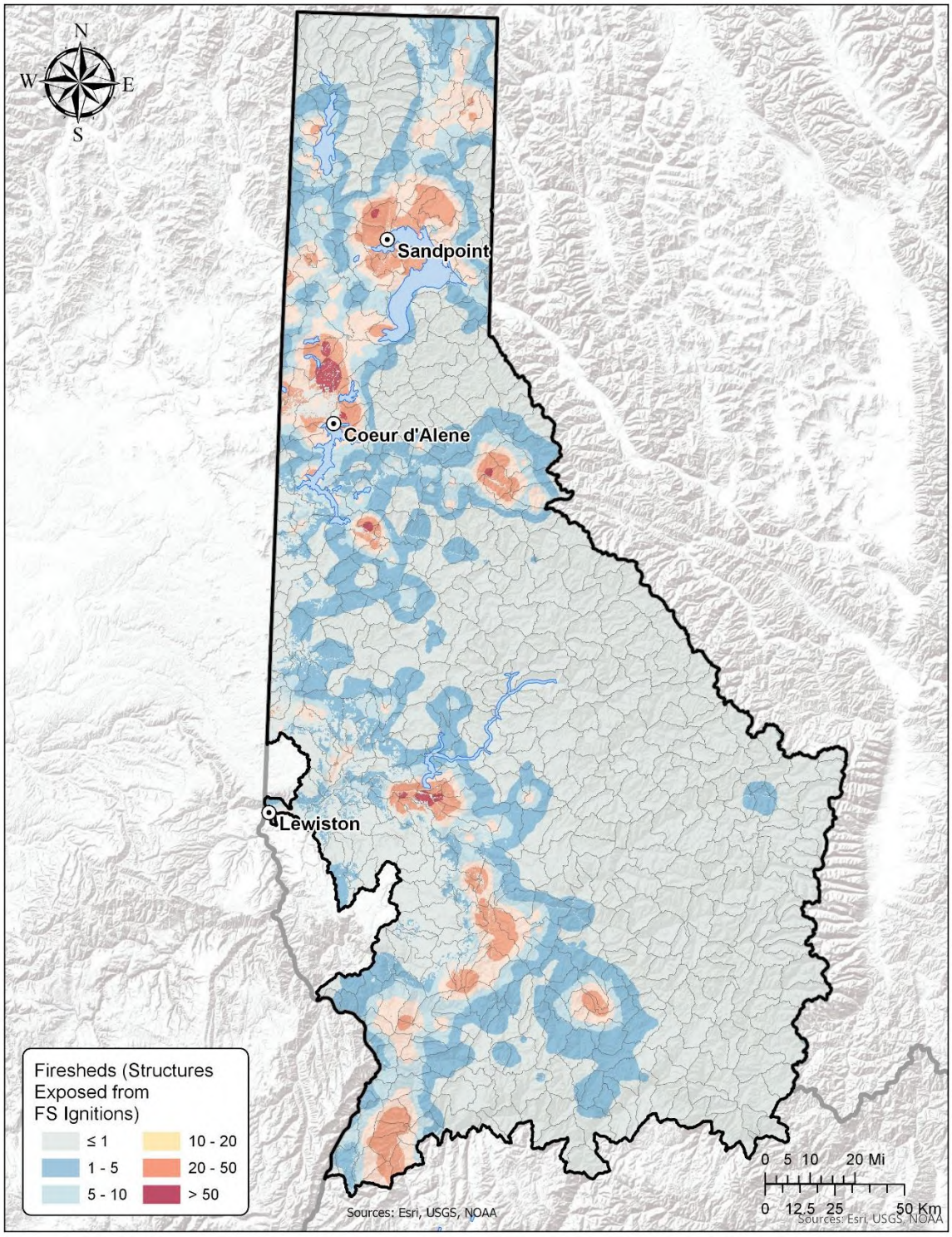


Figure 4. Wildfire exposure to structures in the wildland urban interface from ignitions on all land tenures.

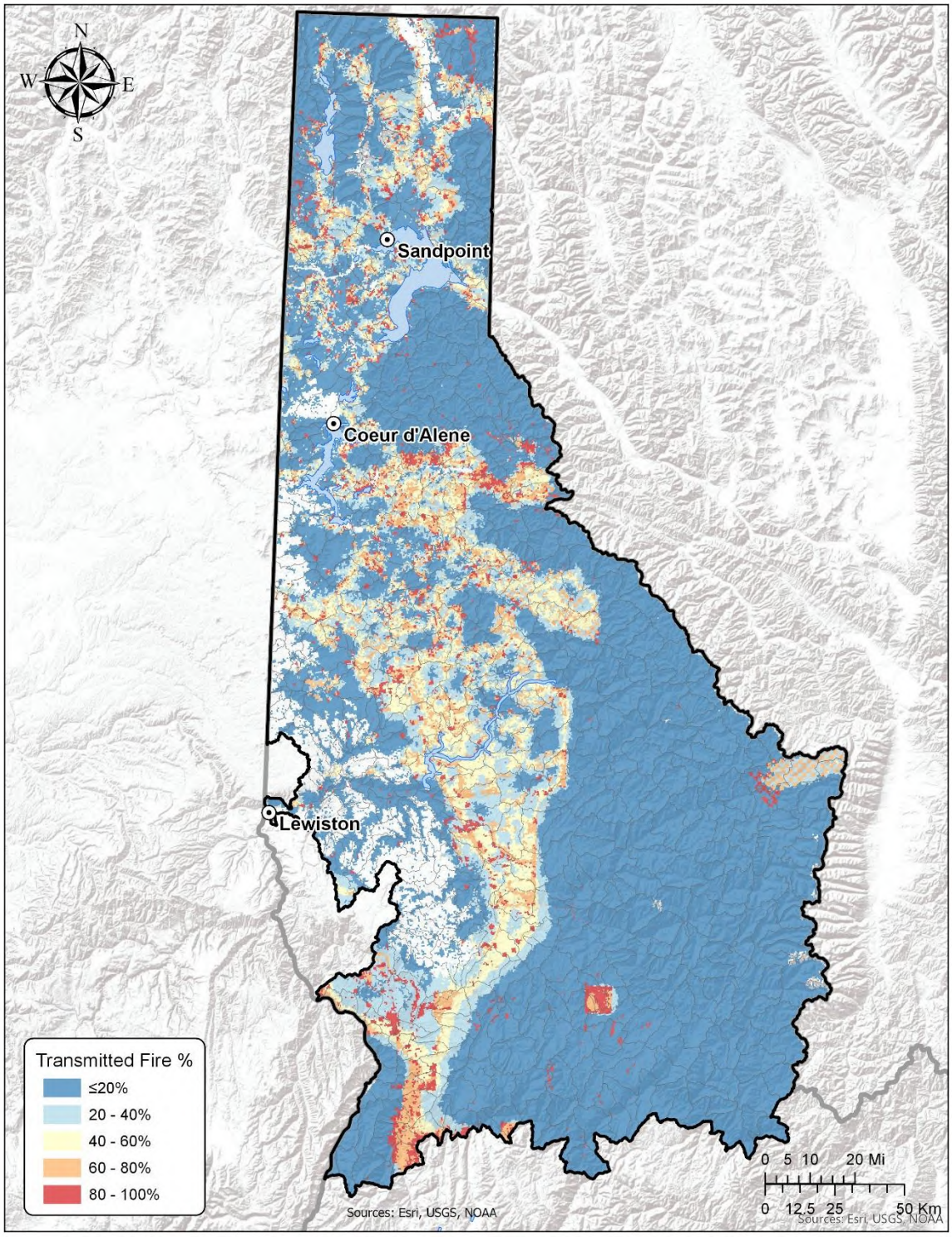


Figure 5. Percentage of wildfire that crosses ownership boundaries in the northern Idaho study area.

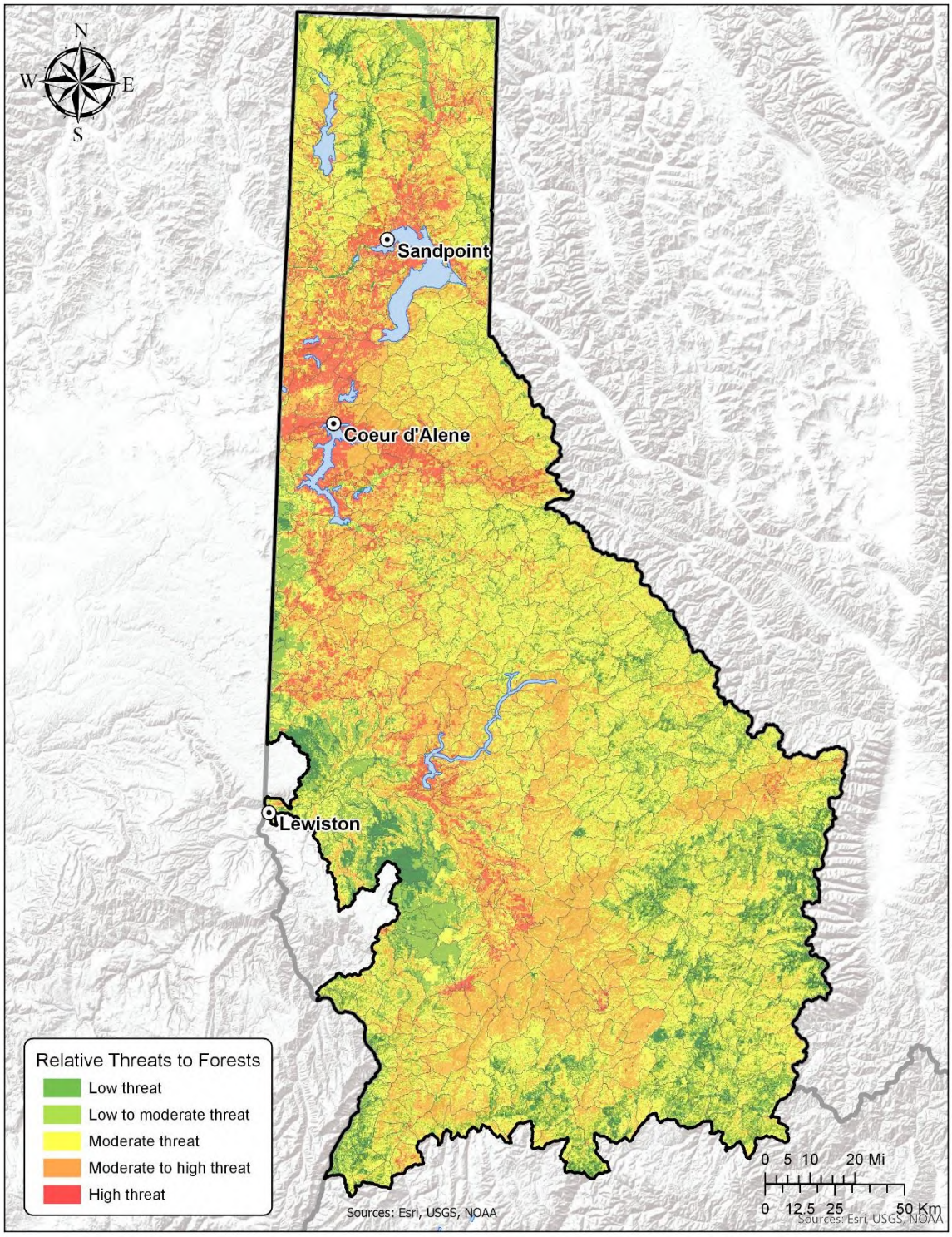


Figure 6. Relative threats from Idaho assessment.

II. Project area priorities and potential attainment

The LTD scenario planning model can be used to explore potential attainment in specified project areas assuming 100% treatment to explore variability among project areas in potential attainment. We simulated mechanical treatment in 509 project areas in northern Idaho, treating 100% of the project area lands available for commercial treatment on any land tenure. We ran simulations for four different priorities: 1) reduce relative threats, 2) reduce wildfire exposure to structures in the wildland urban interface, 3) maximize merchantable timber volume, and 4) reduce transmission of wildfire across land tenures. Potential attainment varies among project areas for each priority (Figs. 7-10).

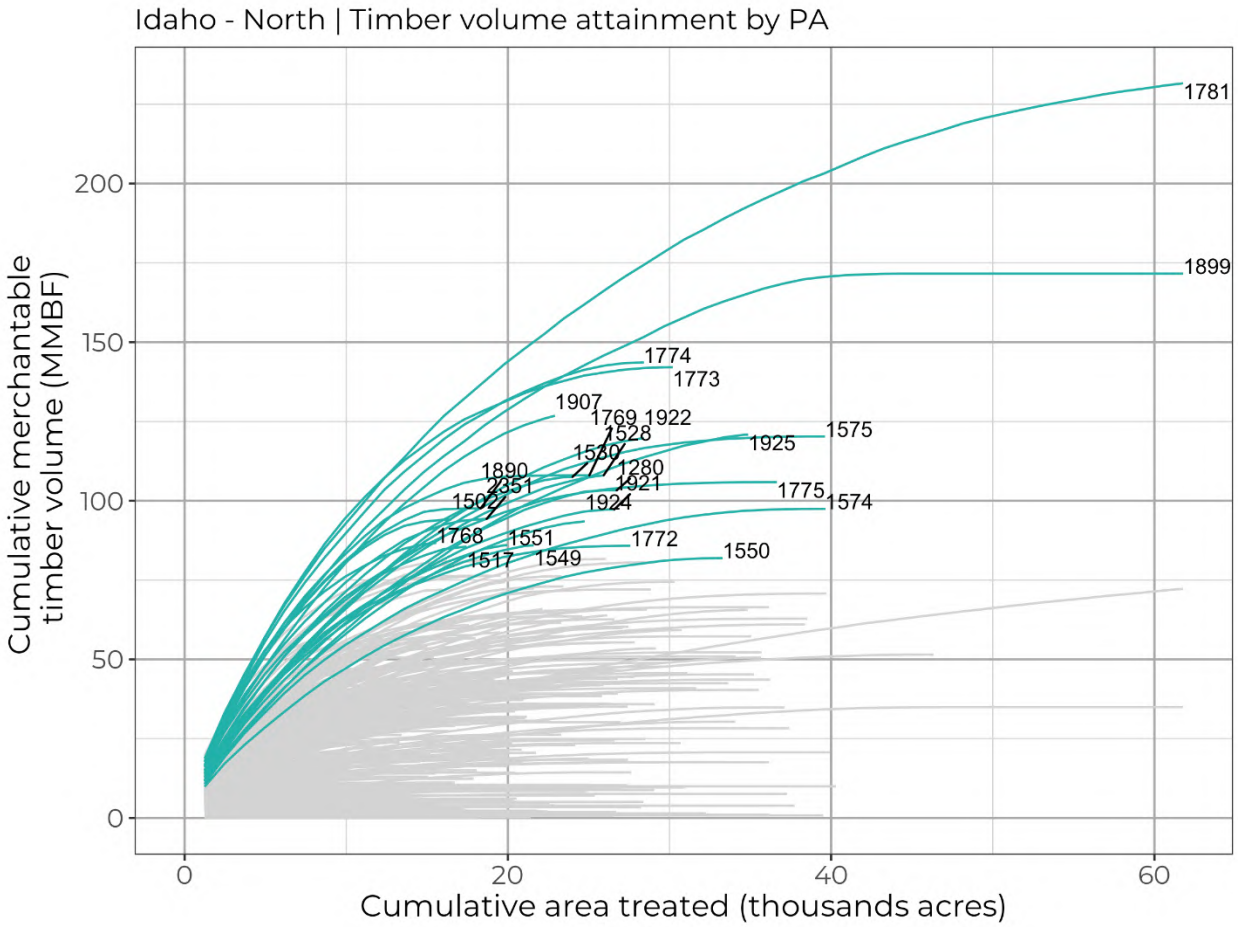


Figure 7. Potential cumulative merchantable timber volume generated with increasing area treated when prioritizing timber volume and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

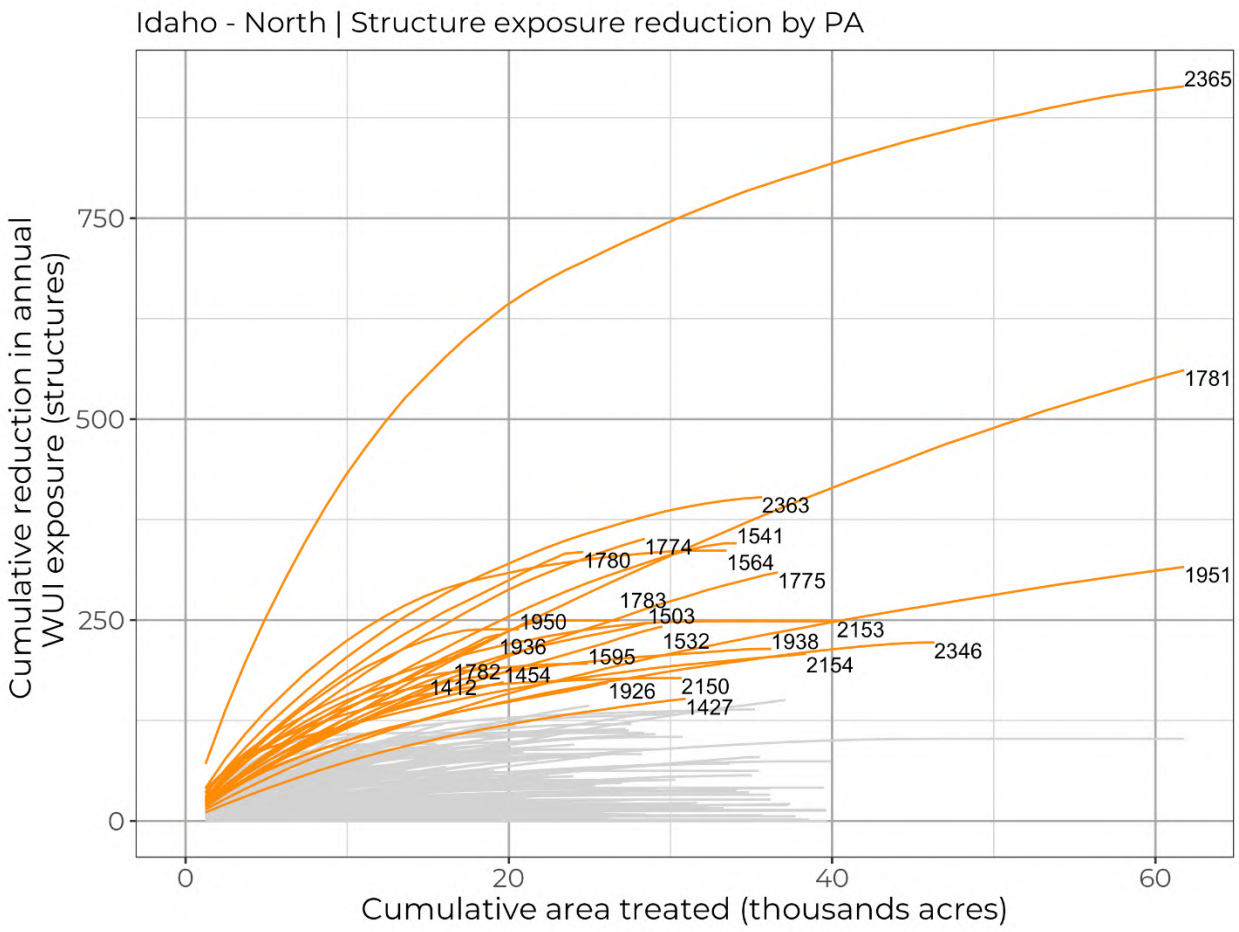


Figure 8. Potential cumulative reduction in structure exposure to wildfire in the wildland urban interface (WUI) generated with increasing area treated when prioritizing structure exposure and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

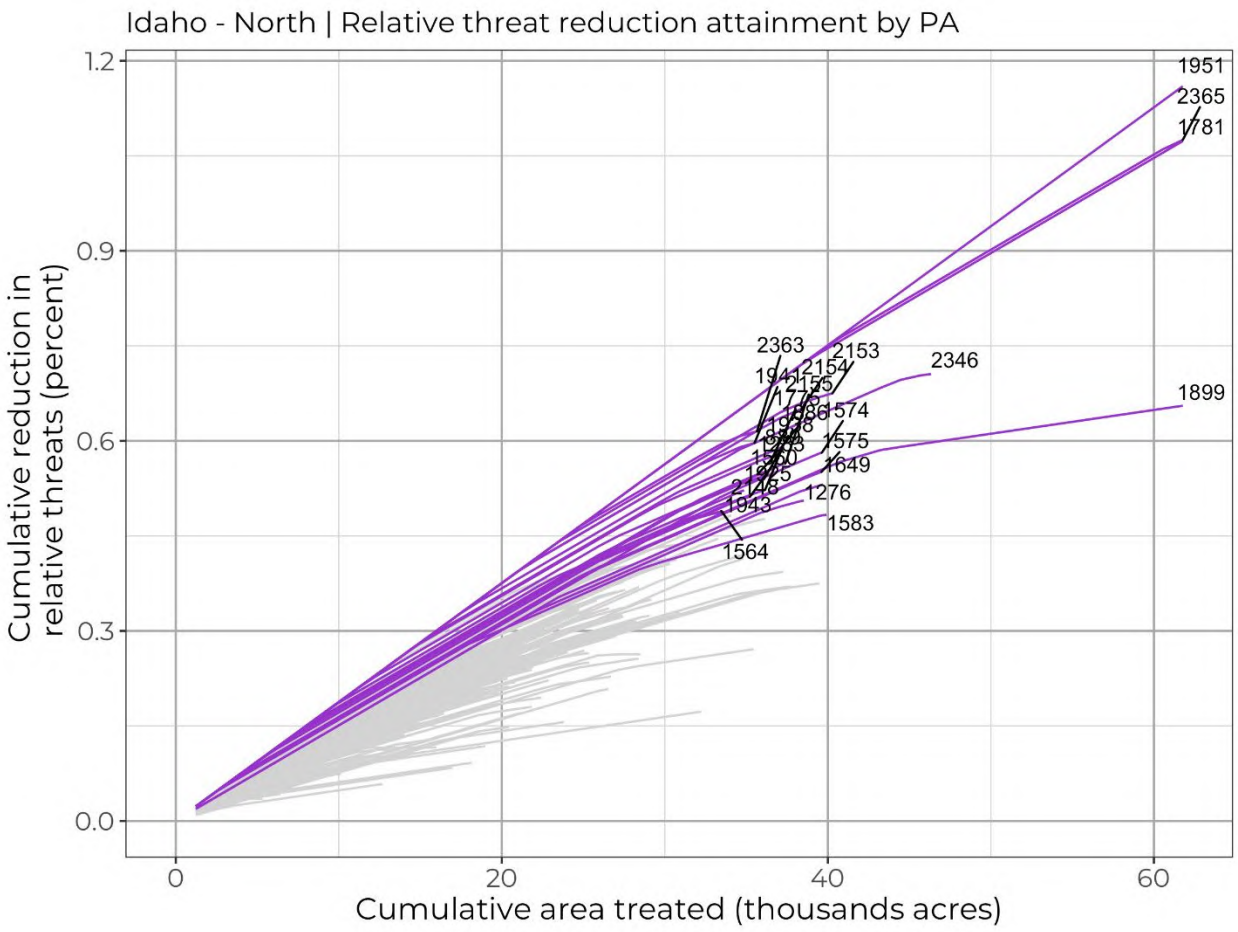


Figure 9. Potential cumulative reduction in relative threats with increasing area treated when prioritizing relative threats and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

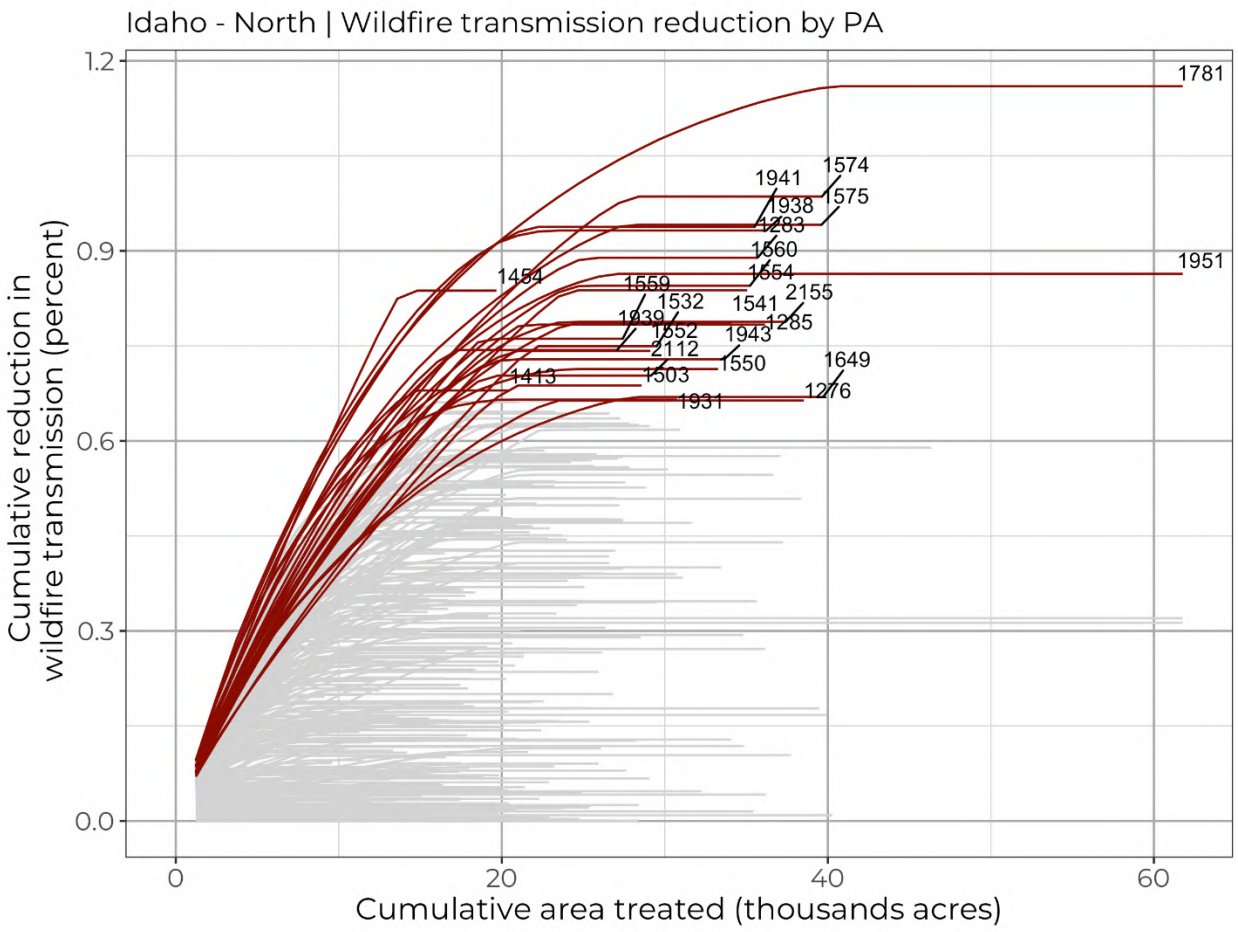


Figure 10. Potential cumulative reduction in wildfire transmission across land tenures with increasing area treated when prioritizing wildfire transmission and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

Again using the LTD scenario planning model we simulated mechanical treatment in 394[1] project areas in Idaho, treating 5000 acres within each project on lands available for commercial treatment on any land tenure. We ran simulations for four different priorities: 1) reduce relative threats, 2) reduce wildfire exposure to structures in the wildland urban interface, 3) maximize merchantable timber volume, and 4) reduce transmission of wildfire across land tenures. Attainment varies as different objectives are prioritized for treatment (Figs. 11-18).

[1] In total 509 projects were treated at some capacity but only 394 of those could reach a 5000 acre treatment area; although total number of treated projects varied somewhat between priorities (433-509).

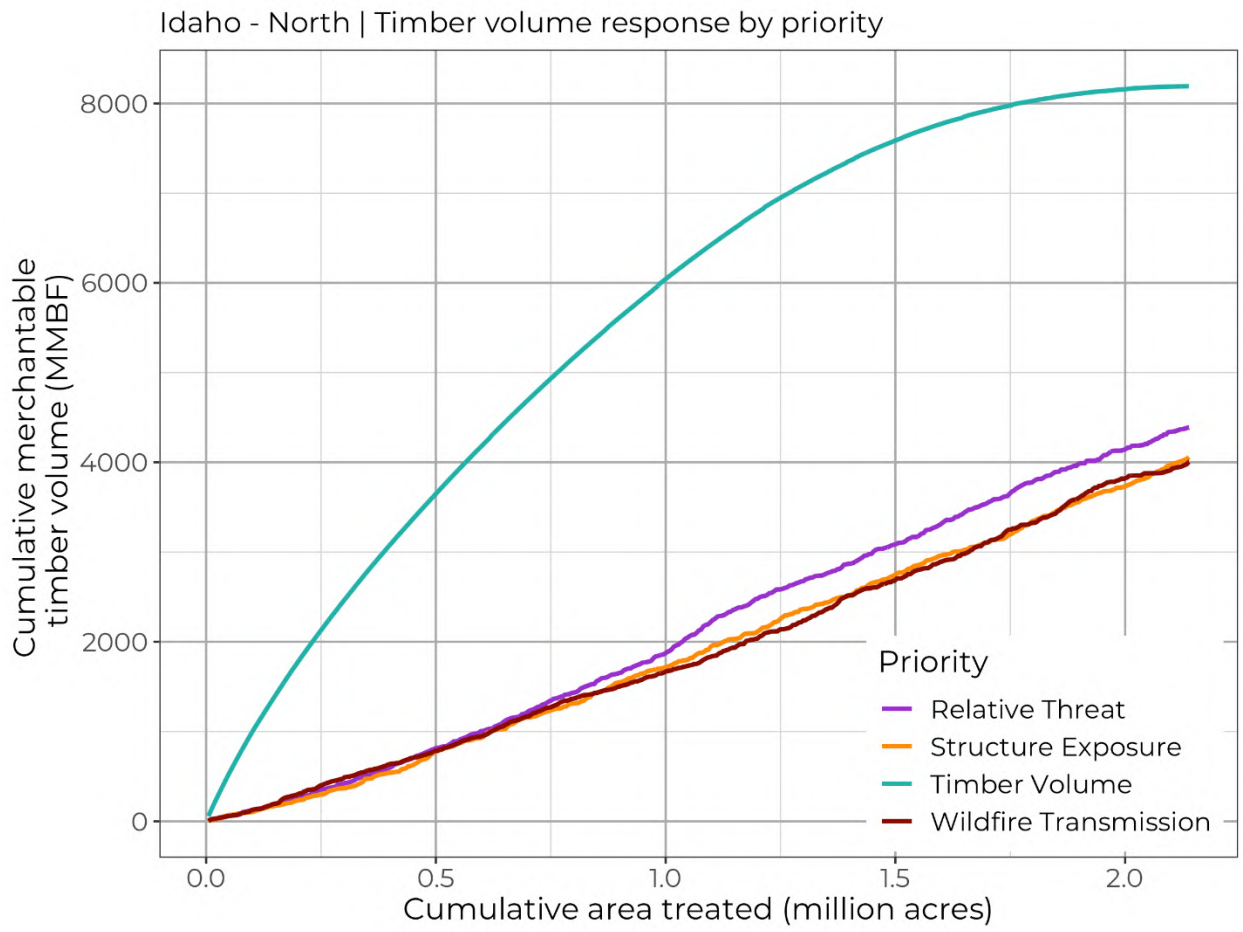


Figure 11. Cumulative merchantable volume generated with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

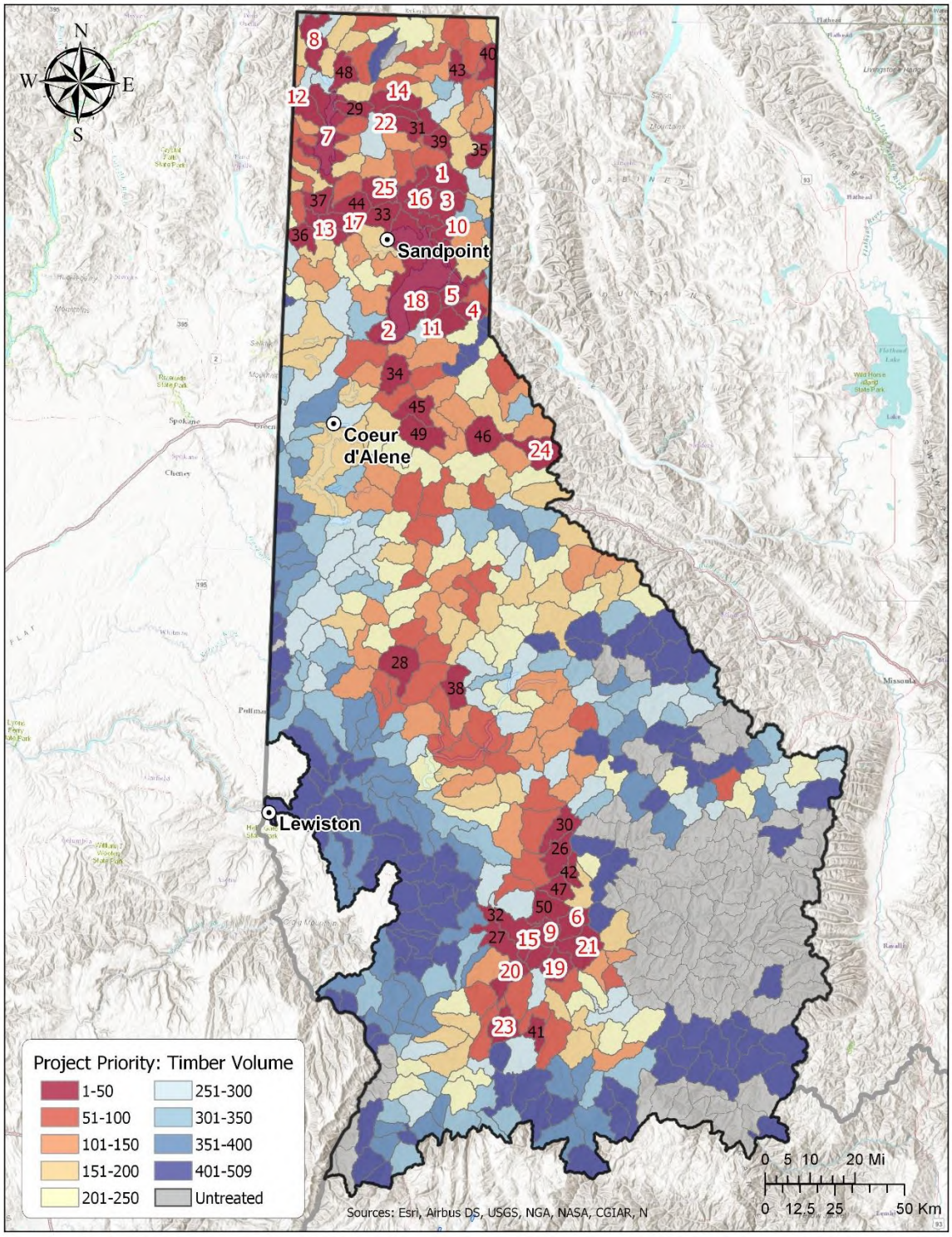


Figure 12. Project areas ranked from highest priority to lowest when prioritizing timber volume. The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

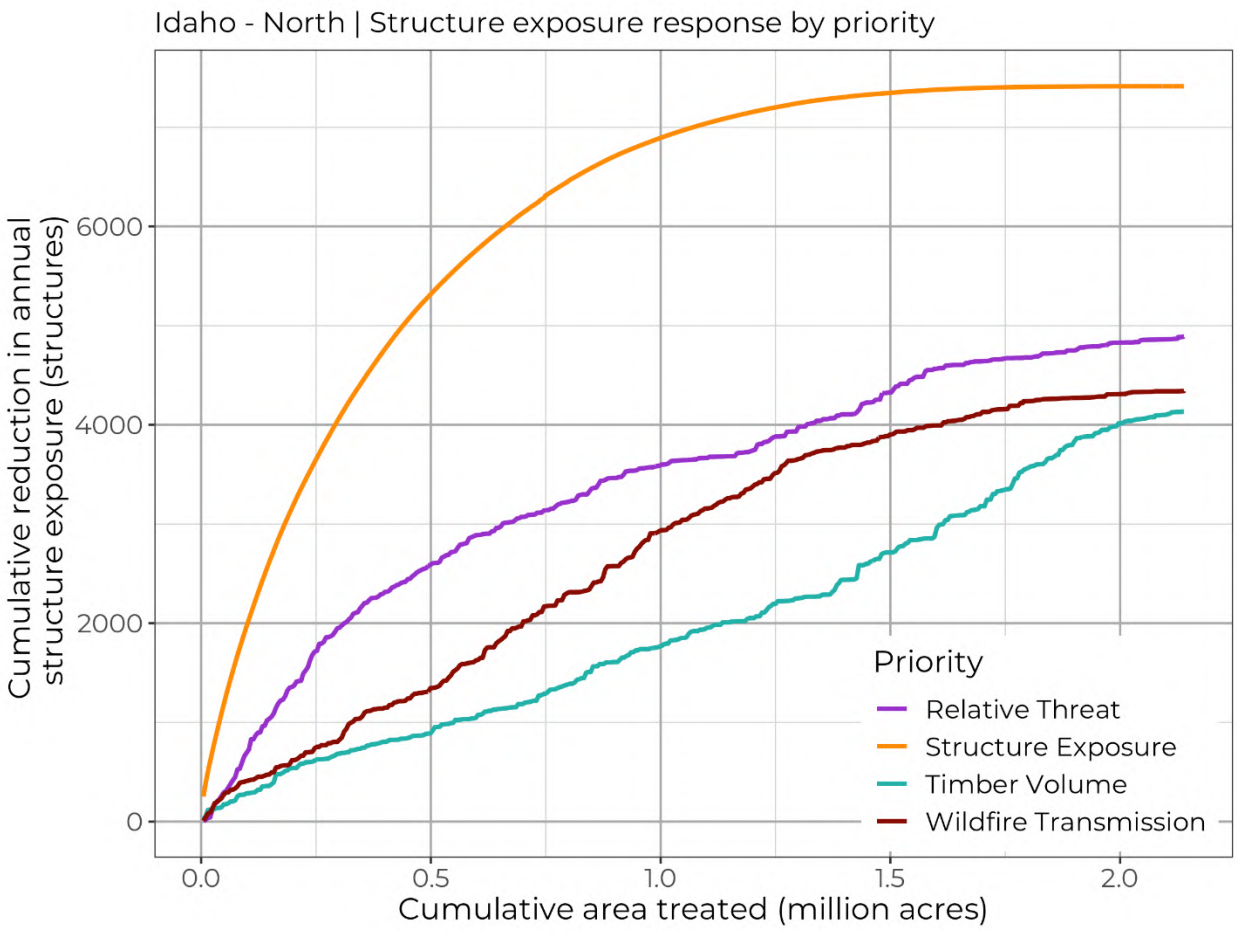


Figure 13. Cumulative reduction in structure exposure to wildfire in the wildland urban interface with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

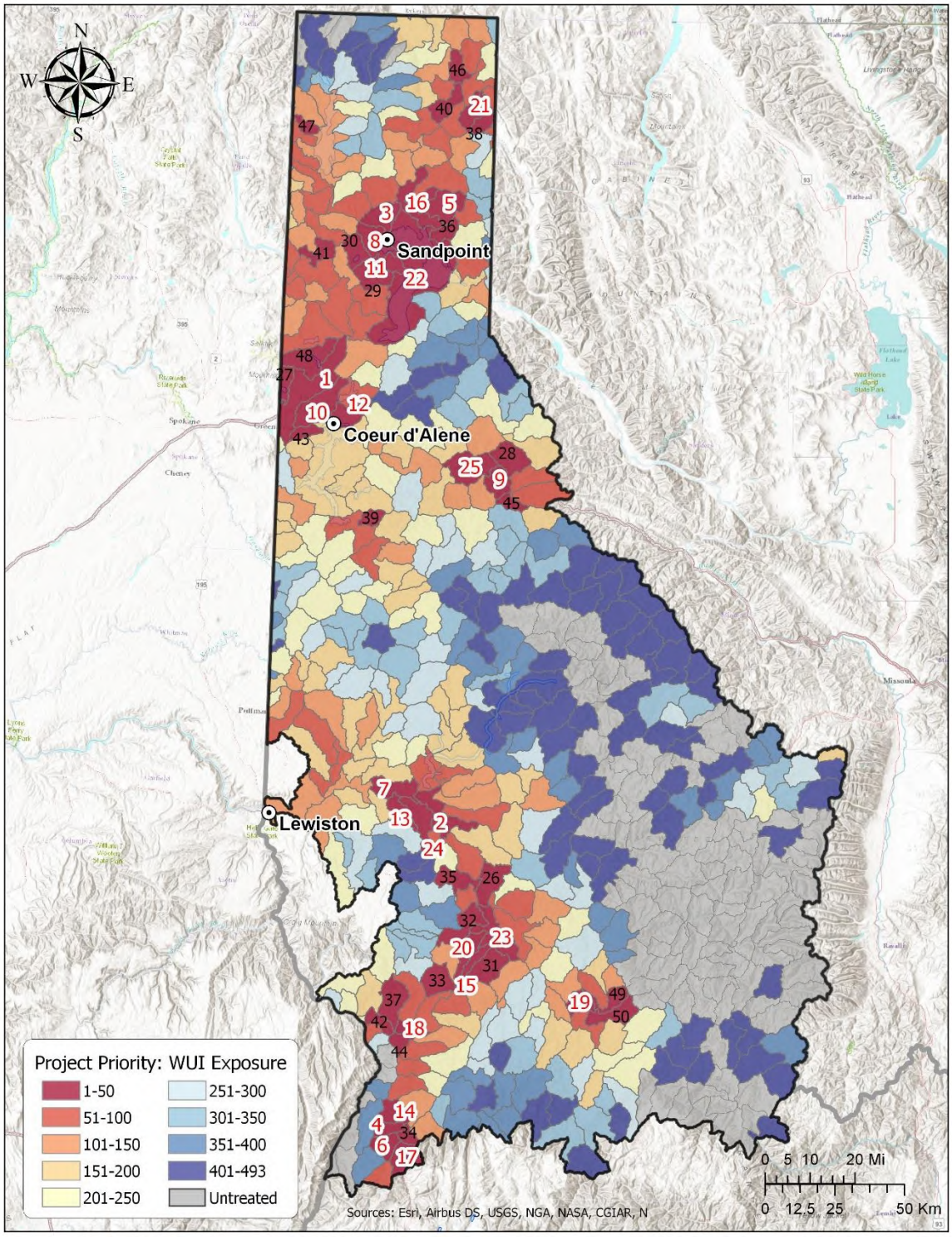


Figure 14. Project areas ranked from highest priority to lowest when prioritizing wildfire exposure to structures in the wildland urban interface (WUI). The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

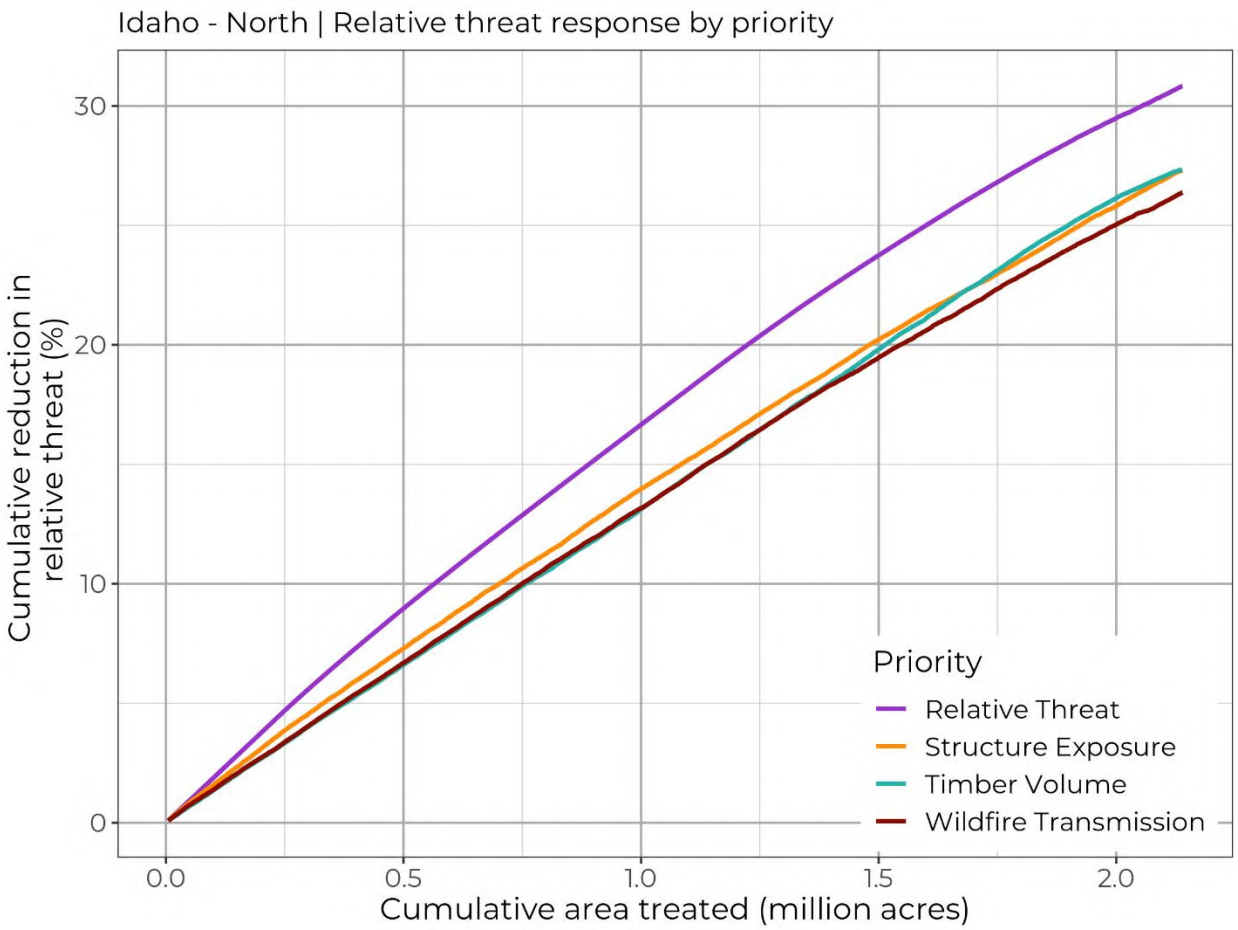


Figure 15. Cumulative reduction in relative threats with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

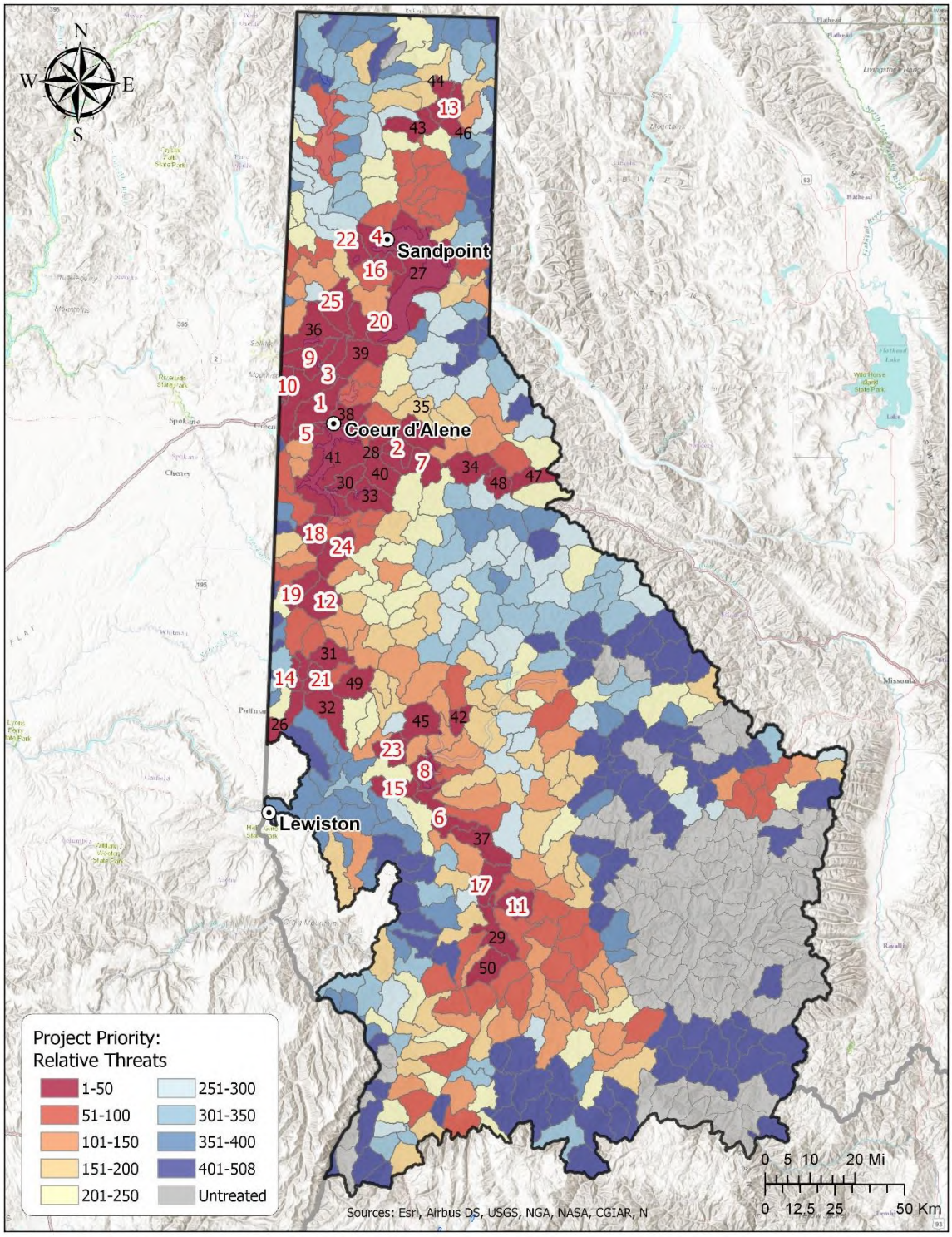


Figure 16. Project areas ranked from highest priority to lowest when prioritizing relative threats. The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

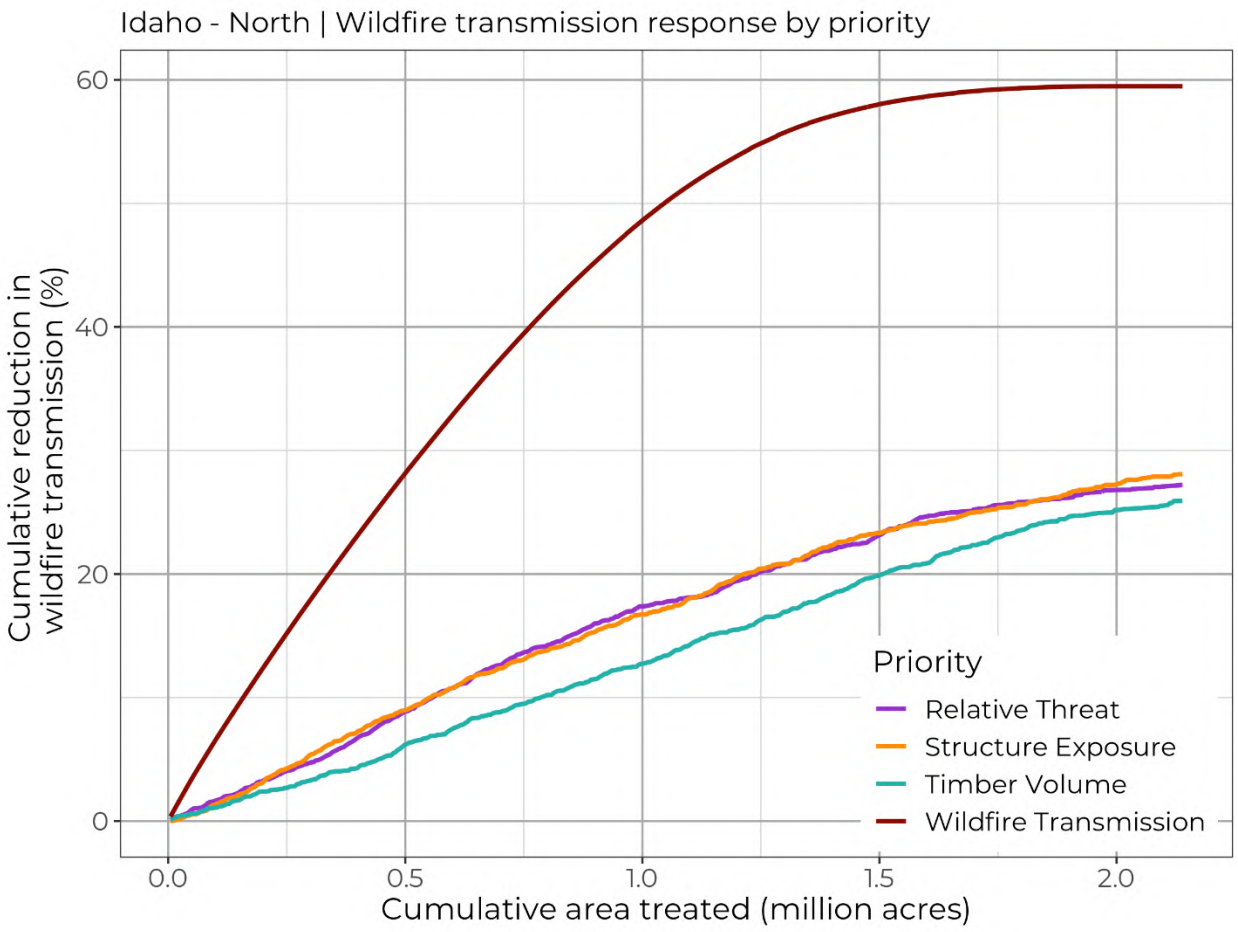


Figure 17. Cumulative reduction in wildfire transmission across land tenures with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

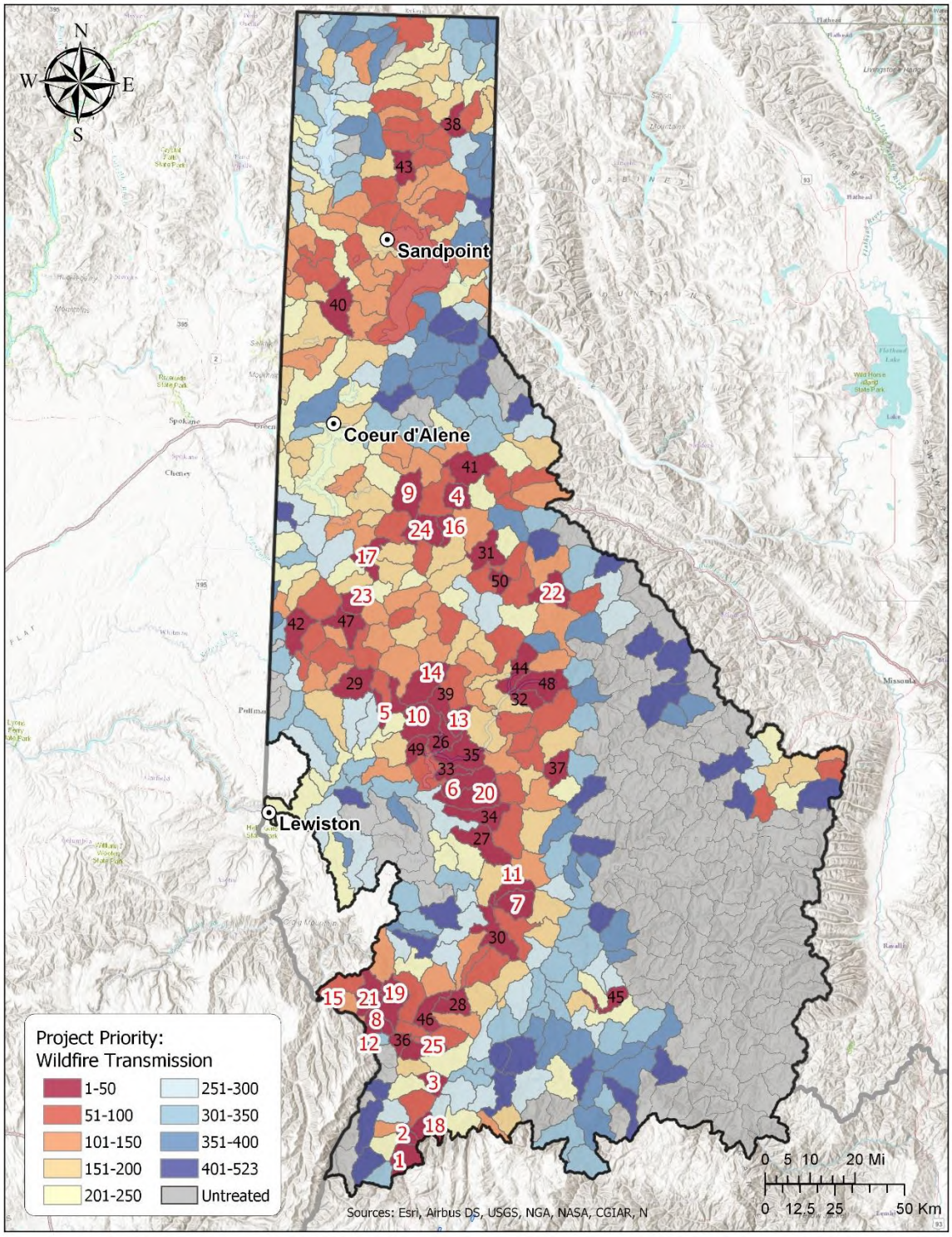


Figure 18. Project areas ranked from highest priority to lowest when prioritizing wildfire transmission across land tenures. The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

If we prioritize treatments to address areas of high threats from the Idaho relative threat assessment, do we address other priorities related to wildfire and harvest volume (Fig. 19)?

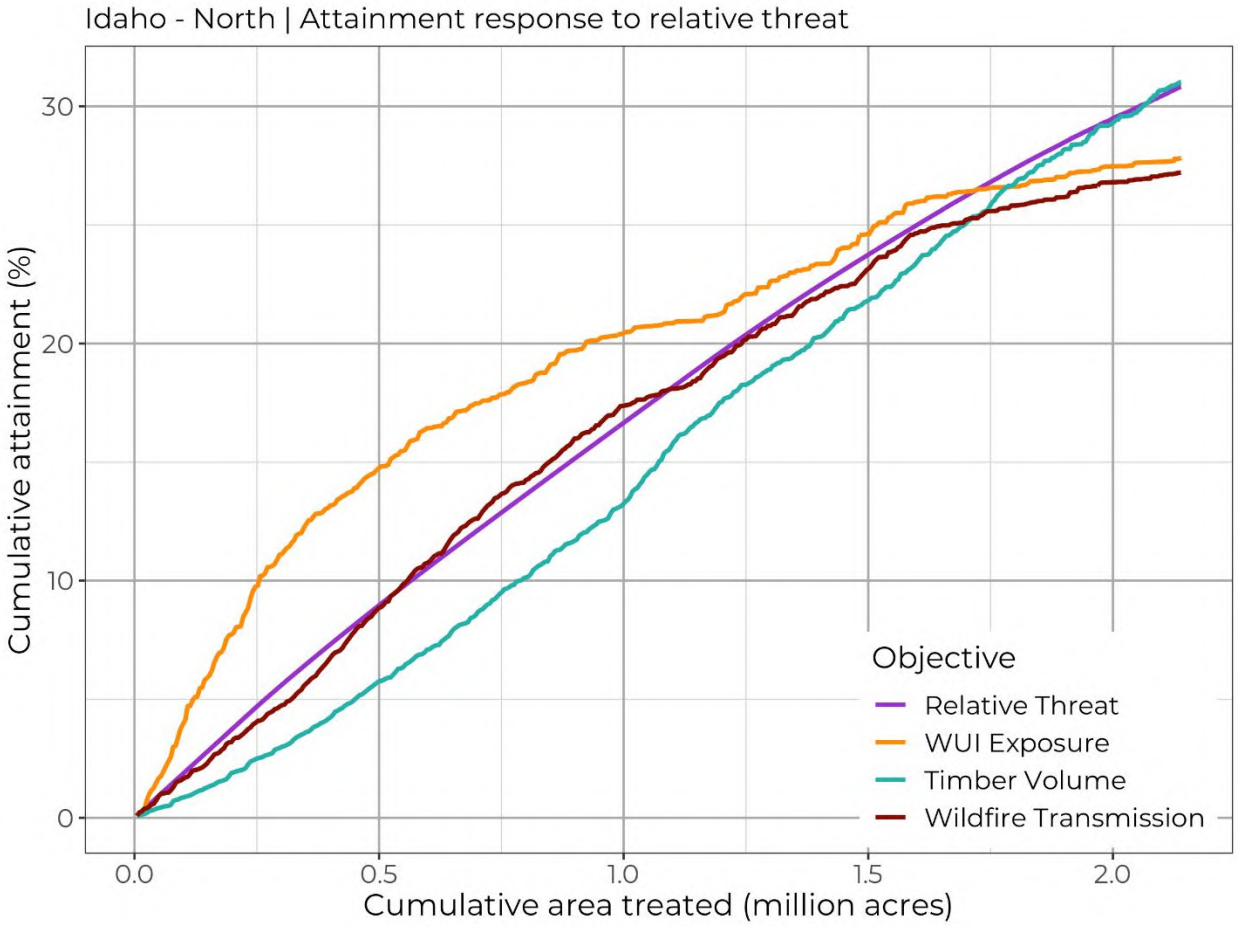


Figure 19. Cumulative attainment in project objectives across all land tenures with increasing area treated when you prioritize the Idaho relative threats assessment. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

If we prioritize treatments according to the Idaho relative threat assessment what is the effect on FS priorities for WUI risk reduction and efficiency of the timber program (Fig. 20)?

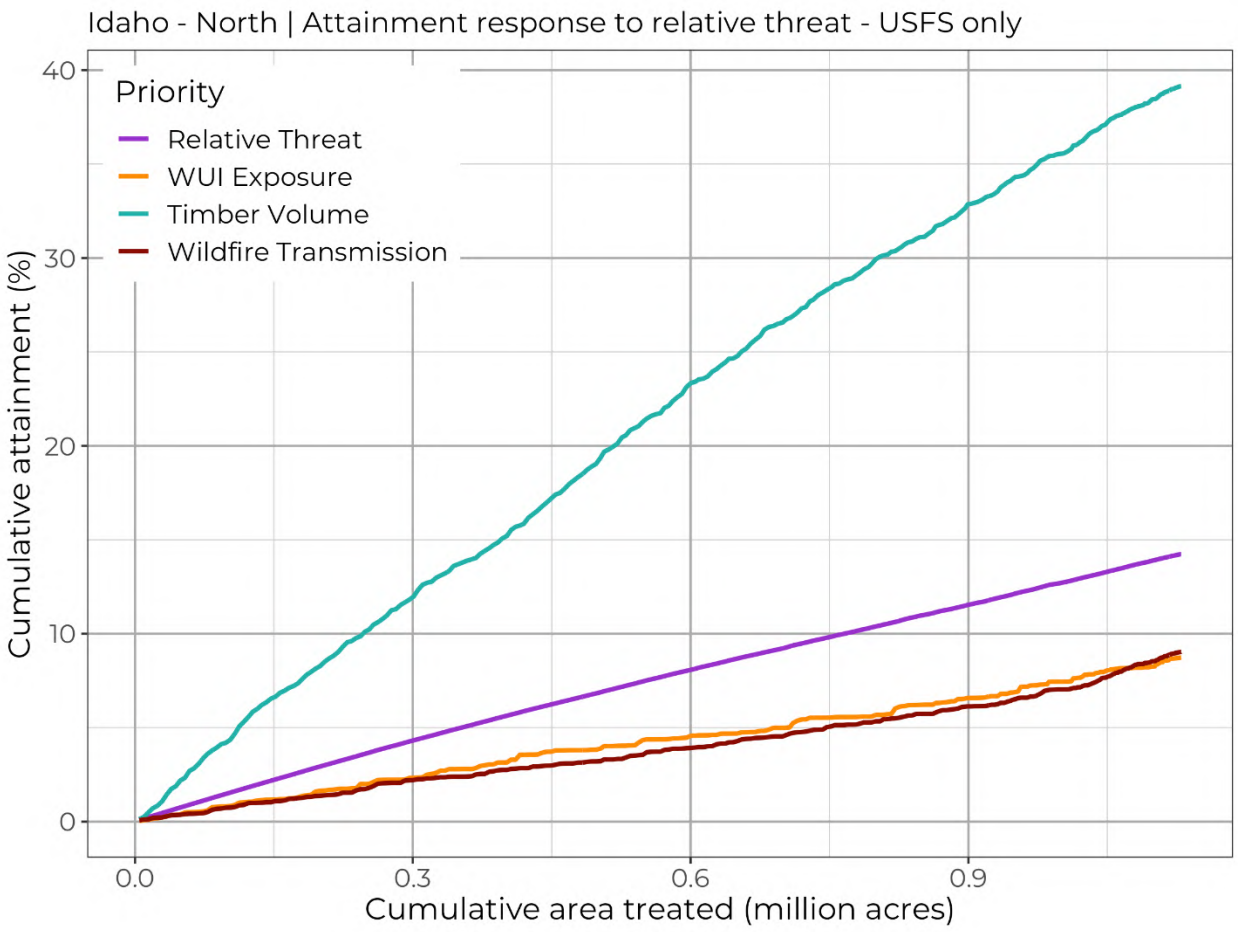


Figure 20. Cumulative attainment in project objectives across all USFS lands only with increasing area treated when you prioritize the Idaho relative threats assessment. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

III. Tradeoffs

We simulated 65 different treatment arrangements in each project that emphasized one or the other objective or both (~25,000 total) to examine the tradeoff between: 1) protecting structures and maximizing merchantable timber volume (Fig. 21); and 2) treating areas of areas of high risk for wildfire transmission and maximizing merchantable timber volume (Fig. 22); 3) reducing relative threats and maximizing merchantable timber volume (Fig. 23); and 4) reducing relative threats and protecting structures (Fig. 24). We treated 5000 acres of each project area on any land tenure across all 509[2] projects.

[2] In total 509 projects were treated at some capacity but only 394 of those could reach a 5000 acre treatment area; although total number of treated projects varied somewhat between priorities (433-509).

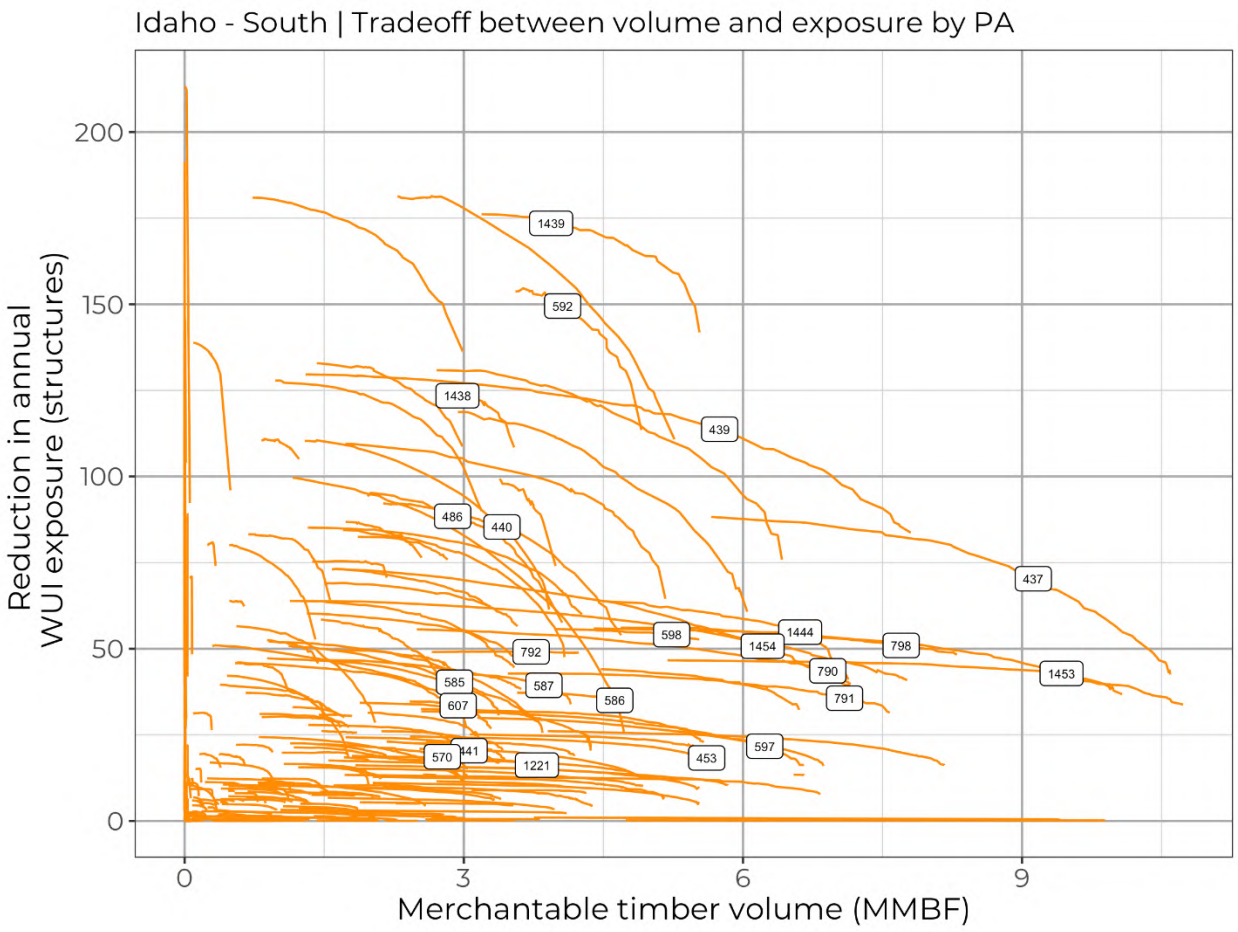


Figure 21. Tradeoff between maximizing merchantable timber volume versus protecting structures from wildfire exposure in the wildland urban interface (WUI) for projects in the northern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

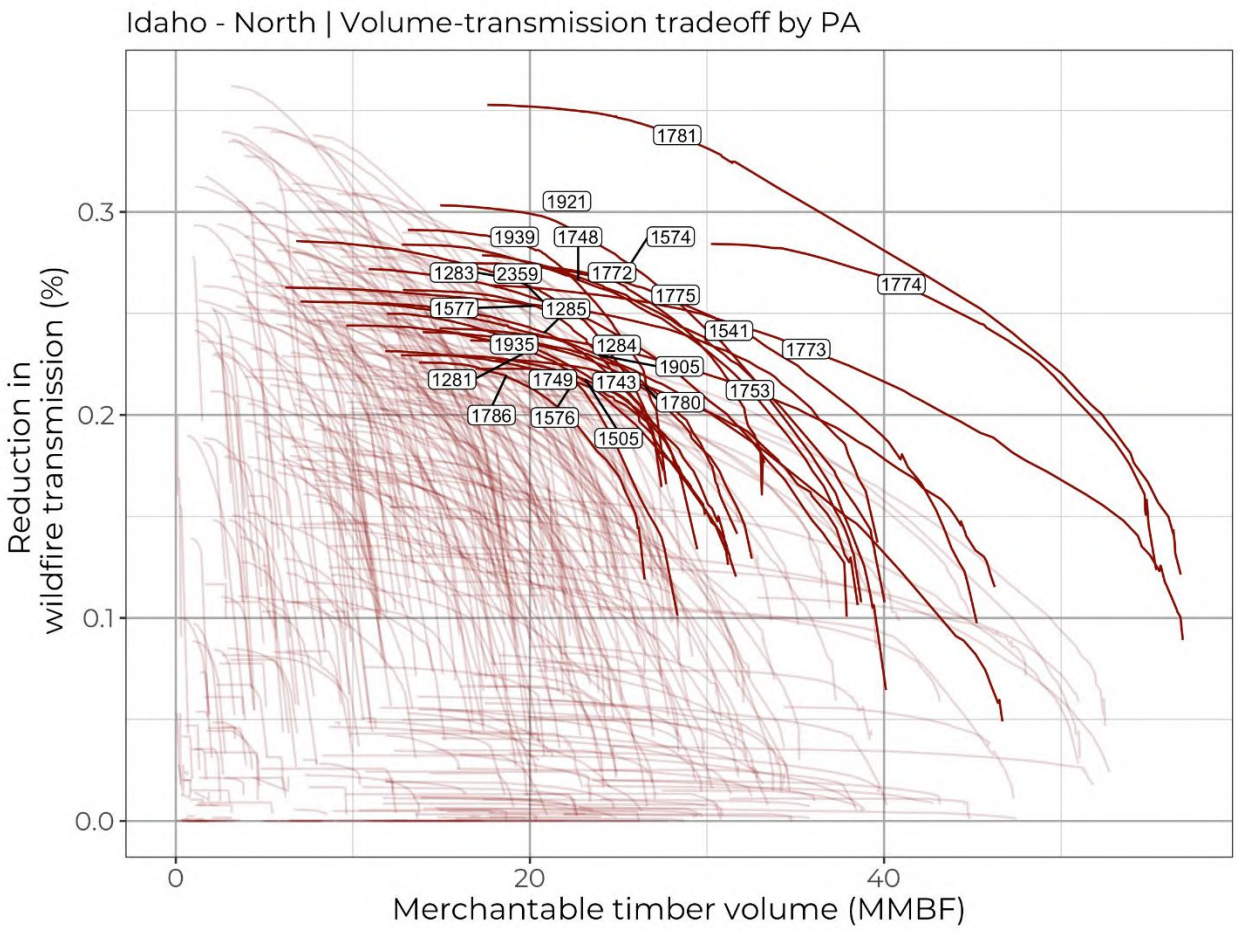


Figure 22. Tradeoff between maximizing merchantable timber volume versus reducing wildfire transmission across land tenures for projects in the northern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

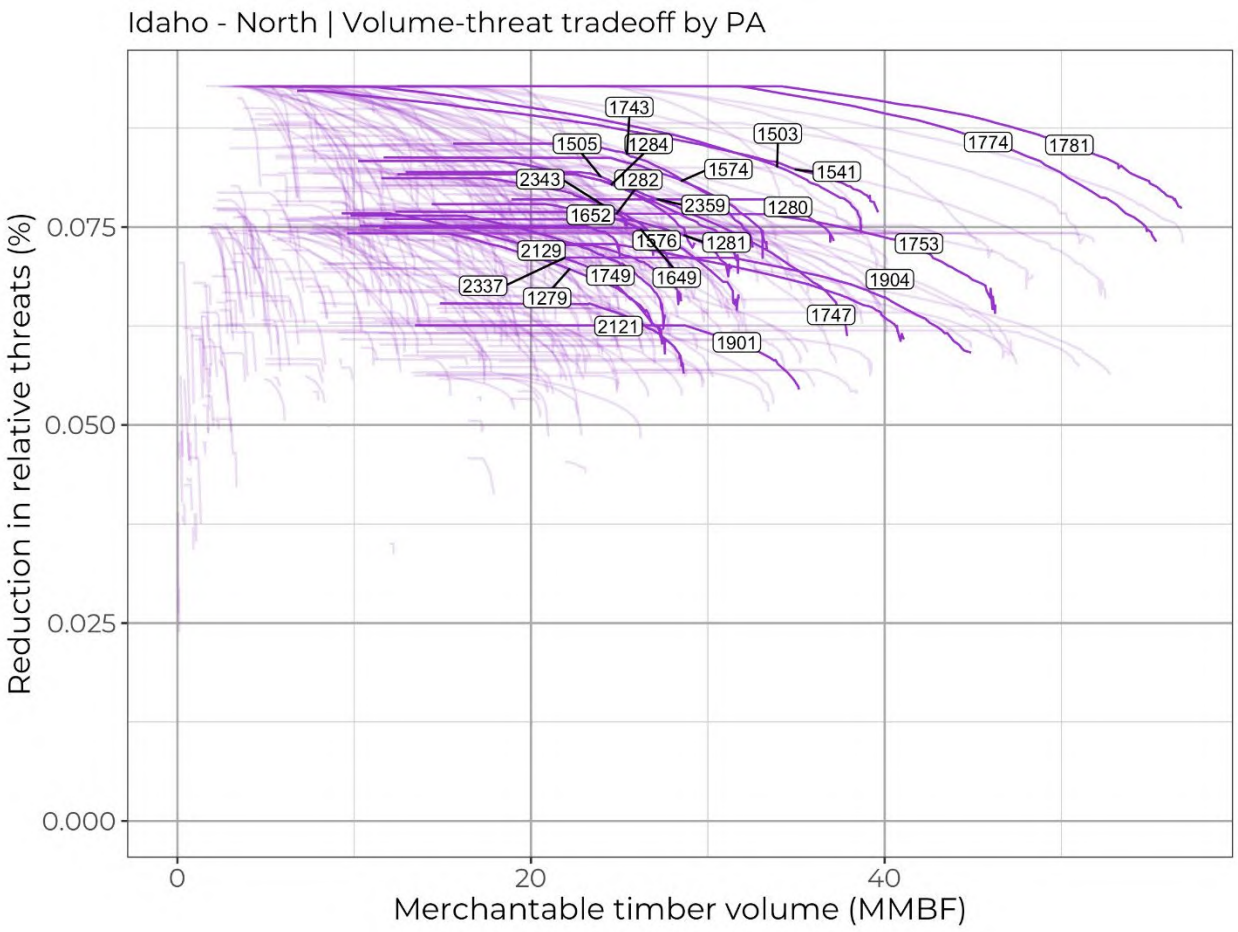


Figure 23. Tradeoff between maximizing merchantable timber volume versus reducing relative threats across land tenures for projects in the northern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

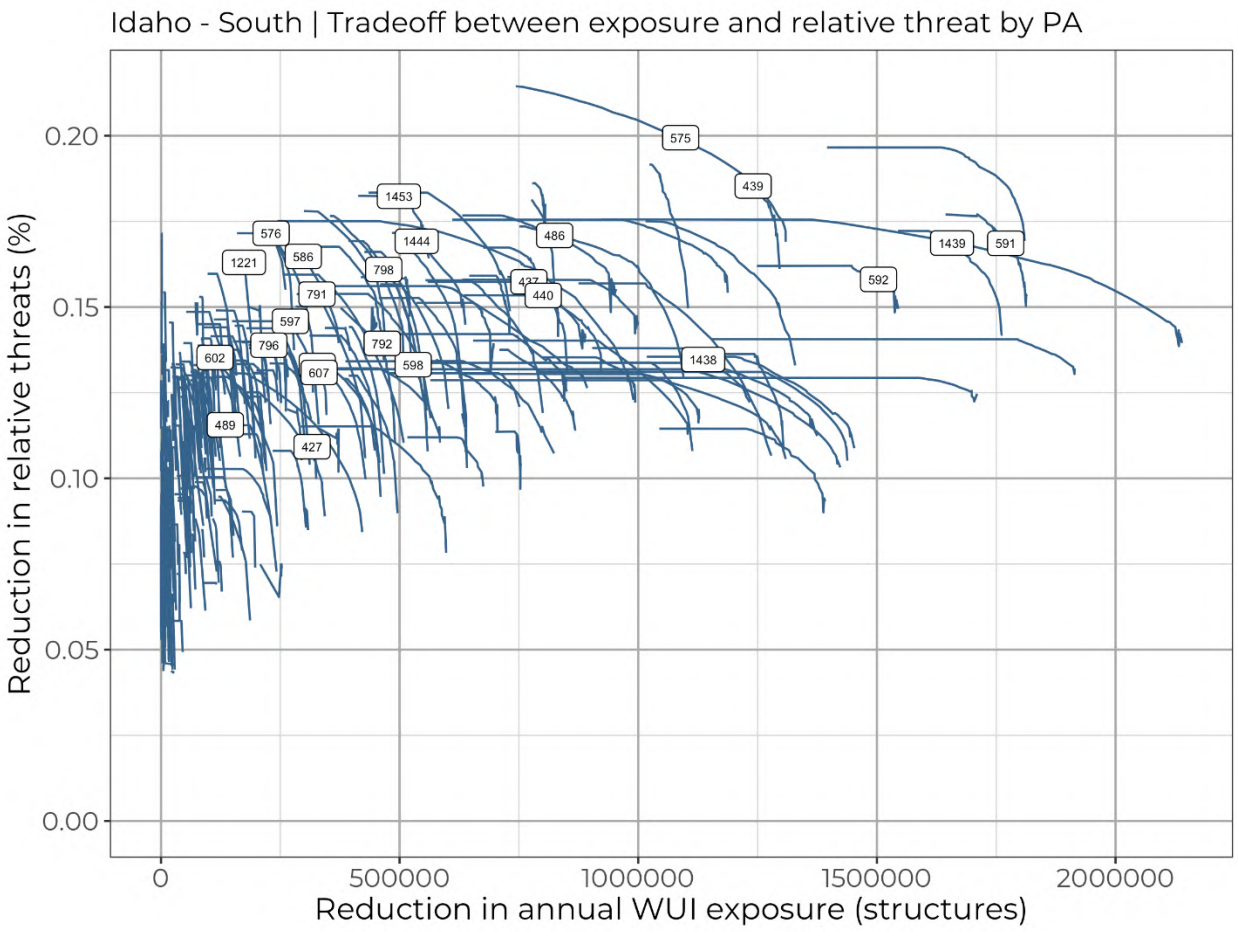


Figure 24. Tradeoff between reducing wildfire exposure to structures in the wildland urban interface (WUI) versus reducing relative threats across all land tenures for projects in the northern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

IV. Leveraging Collaborative Opportunities to Reduce Risk

We simulated treatments on all 509 project areas, treating 5000 acres of each project on any land tenure when prioritizing reduction in relative threats. These treatment solutions were then filtered to those collaborative projects where no one land tenure represented greater than 50% of the treated area. This resulted in 38 collaborative project opportunities (Fig. 25). These were then ranked from highest priority to lowest when prioritizing relative threats. When prioritizing treatments to address areas of high threat from the Idaho state assessment we can also assess how well we achieve other restoration objectives (Fig. 26).

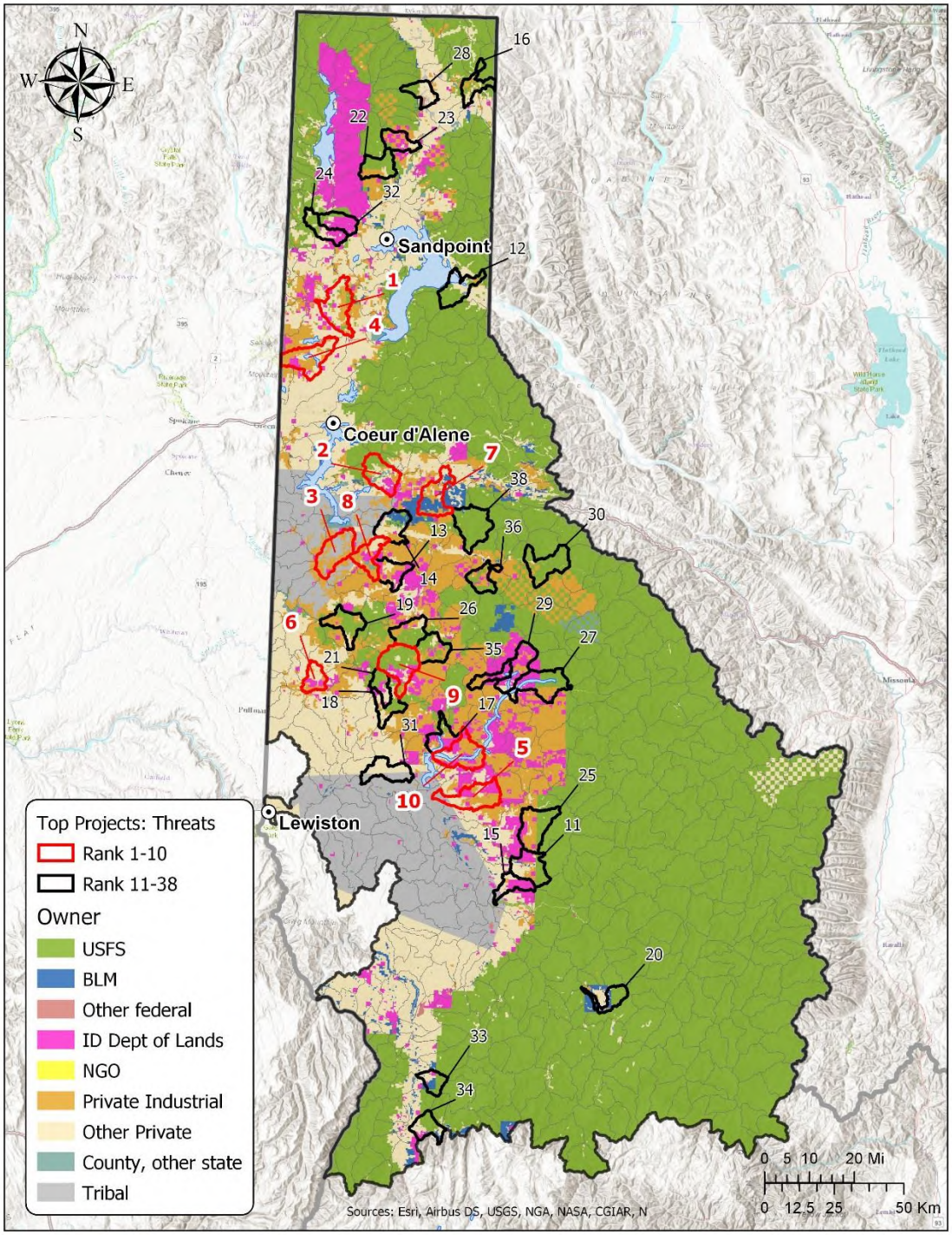


Figure 25. Top 38 project areas when prioritizing relative threats and filtering projects for collaborative opportunities where no single land tenure contributes more than 50% to the treatment area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. BLM = Bureau of Land Management; USFS = US Forest Service; NGO = non-governmental organization.

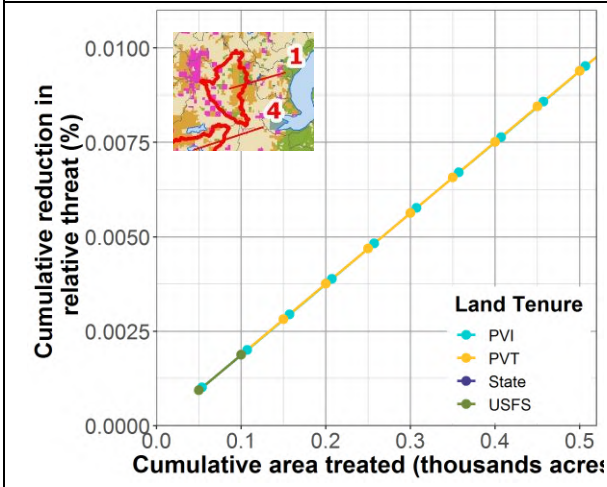
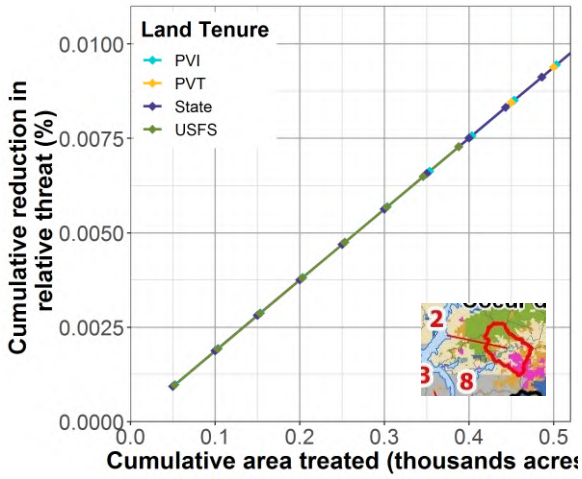
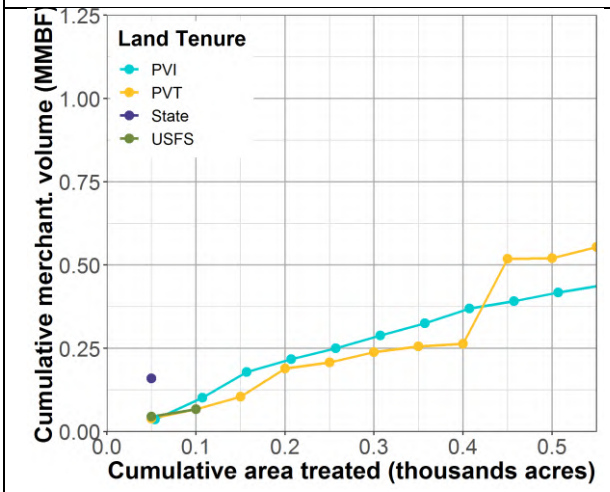
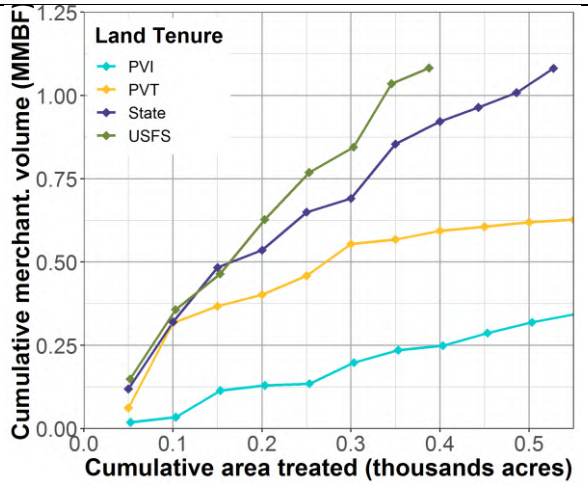
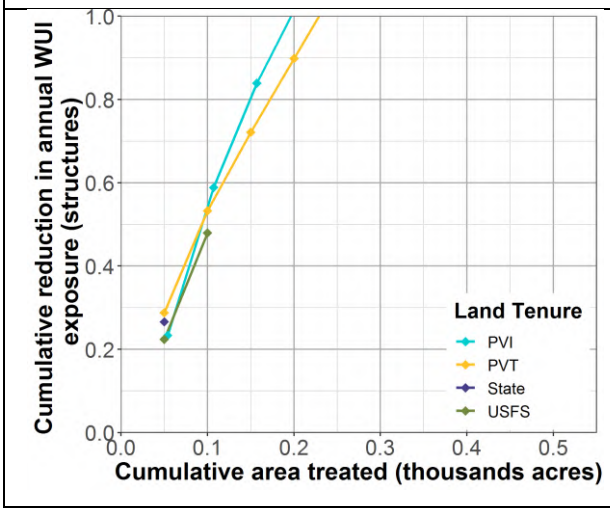
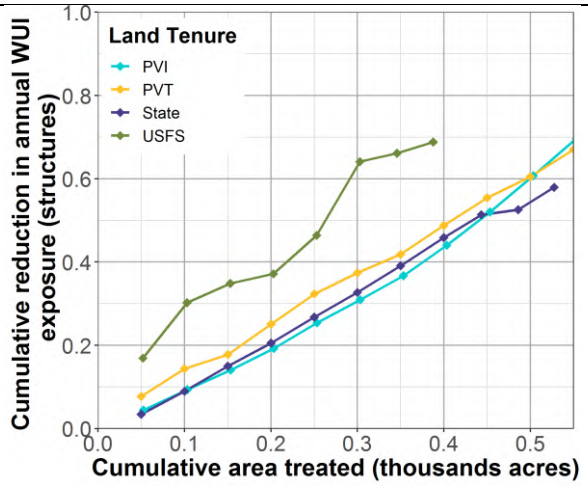
Priority = Reduction in relative threats	
Project 1886, rank #1	***Project 1942, rank #2***
	
	
	

Figure 26. Two of the top 38 project areas (#1886 and #1942) when prioritizing relative threats and filtering projects for collaborative opportunities. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Attainment graphs show attainment by land tenure for the prioritized objective (top row) and attainment in other restoration goals. Graphs are truncated to highlight state and USFS lands. BLM = Bureau of Land Management; PVI = Private Industrial; PVT = Private; USFS = US Forest Service.

We also simulated treatments on all 509 project areas, treating 5000 acres of each project on any land tenure when prioritizing reduction in exposure to the wildland urban interface. These treatment solutions were then filtered to those collaborative projects where no one land tenure represented greater than 50% of the treated area. This resulted in 23 collaborative project opportunities (Fig. 27). These were then ranked from highest priority to lowest when prioritizing reduction in WUI exposure. When prioritizing treatments to address areas of high exposure we can also assess how well we achieve other restoration objectives (Fig. 28).

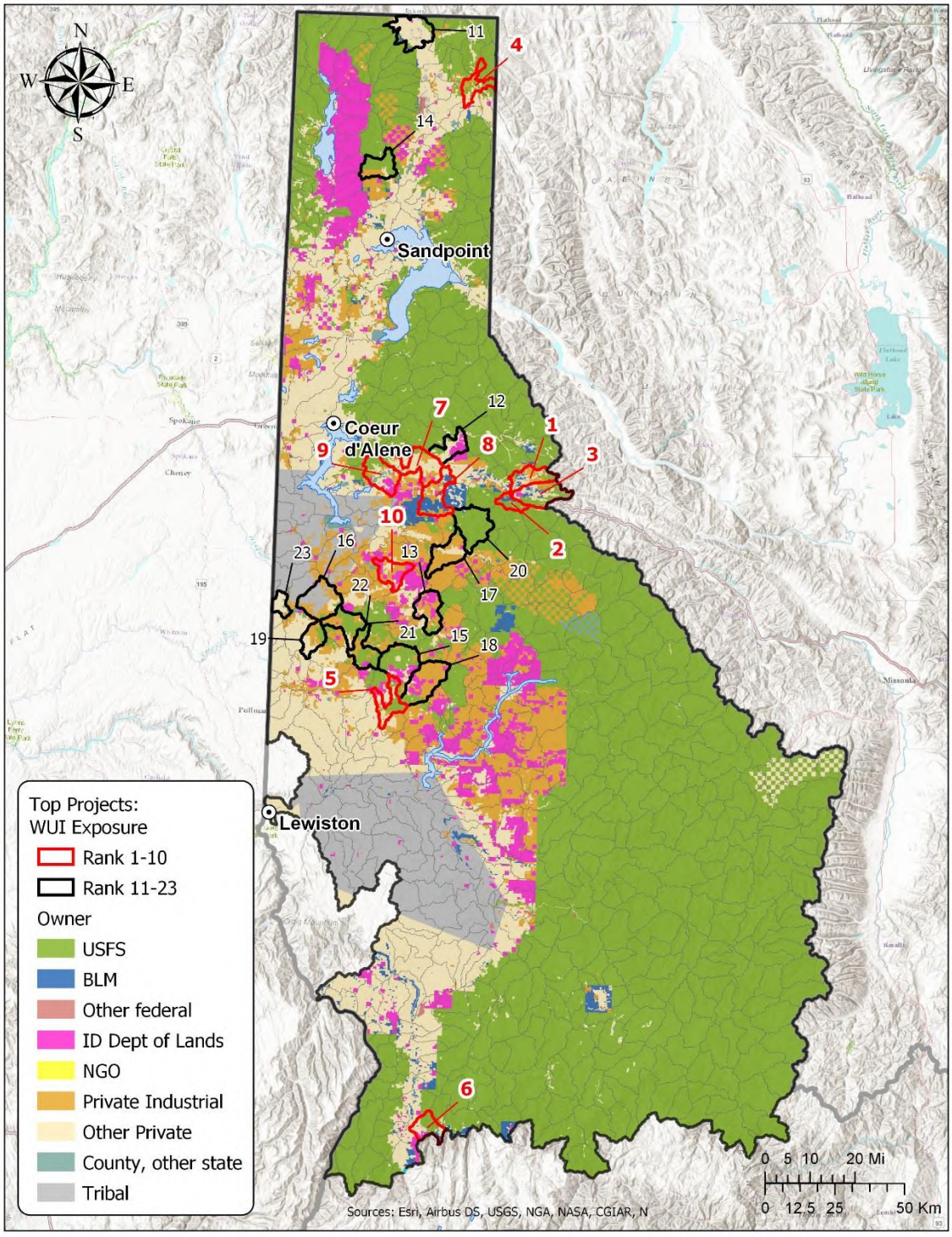


Figure 27. Top 23 project areas when prioritizing reduction in wildfire exposure to the wildland urban interface (WUI) and filtering projects for collaborative opportunities where no single land tenure contributes more than 50% to the treatment area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. BLM = Bureau of Land Management; USFS = US Forest Service; NGO = non-governmental organization.

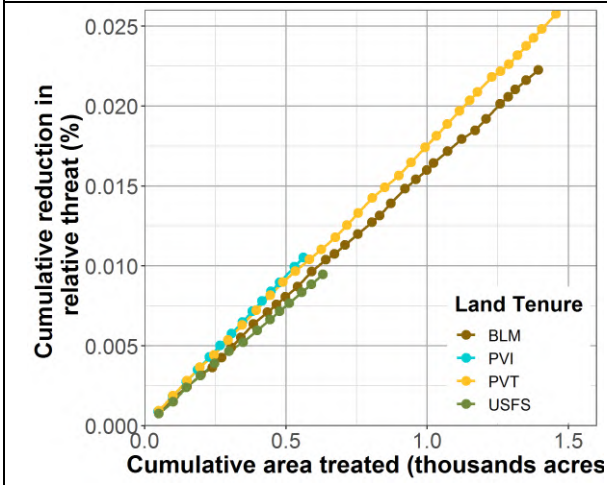
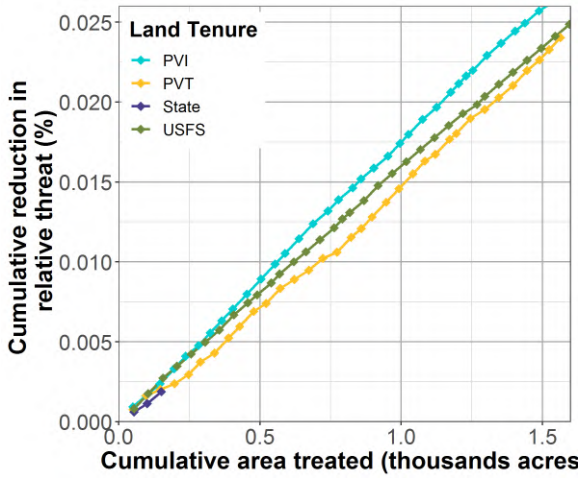
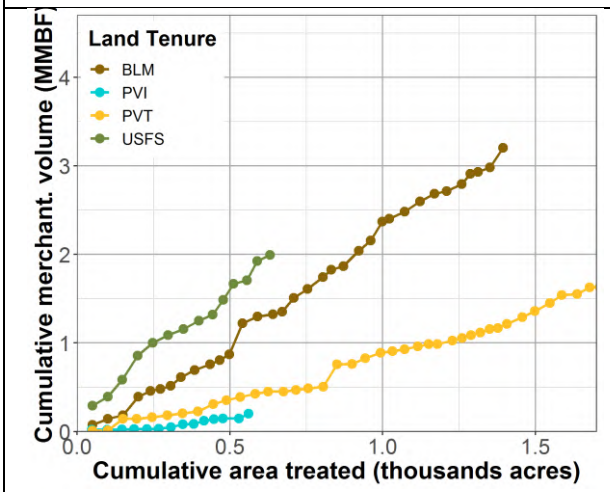
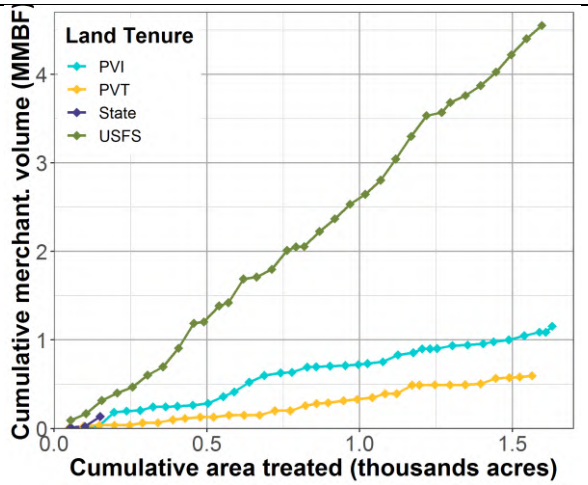
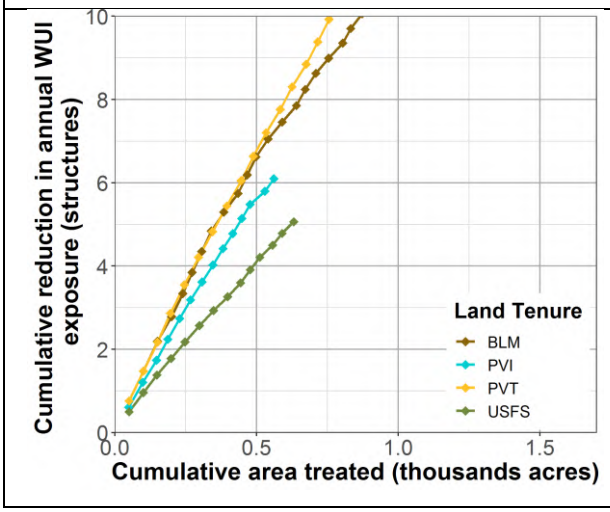
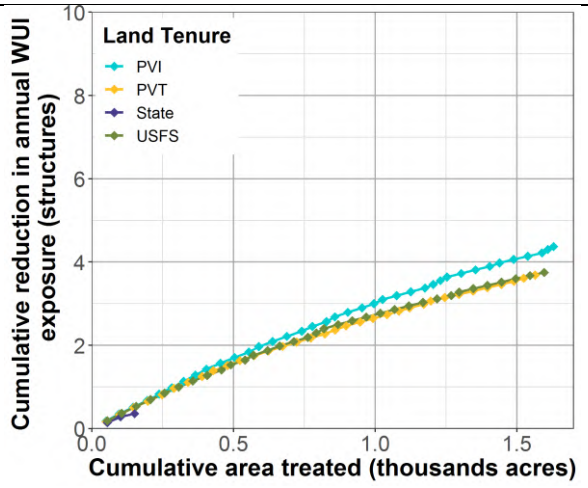
Priority = Reduction in WUI exposure	
Project 1932, rank #1	***Project 1942, rank #9***
	
	
	

Figure 28. Two of the top 23 project areas (#1932 and #1942) when prioritizing reduction in wildfire exposure to the wildland urban interface (WUI) and filtering projects for collaborative opportunities. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Attainment graphs show attainment by land tenure for the prioritized objective (bottom row) and attainment in other restoration goals. Graphs are truncated to highlight state and USFS lands. BLM = Bureau of Land Management; PVI = Private Industrial; PVT = Private; USFS = US Forest Service.

Chapter 2. Shared Stewardship – Southern Idaho

Updated: June 4, 2019

Summary

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I. Assessment of current conditions and opportunities

Land tenures were delineated in the Idaho shared stewardship study area based on the Protected Areas Database (USGS), Forest Service administrative lands and state private industrial designations (Fig. 1), and assessed for areas that are suitable for treatment on US Forest Service managed lands by removing wilderness, designated use limitations, and roadless areas. Project areas were delineated based on Idaho Department of Lands staff following HUC12 subwatershed boundaries (Fig. 2).

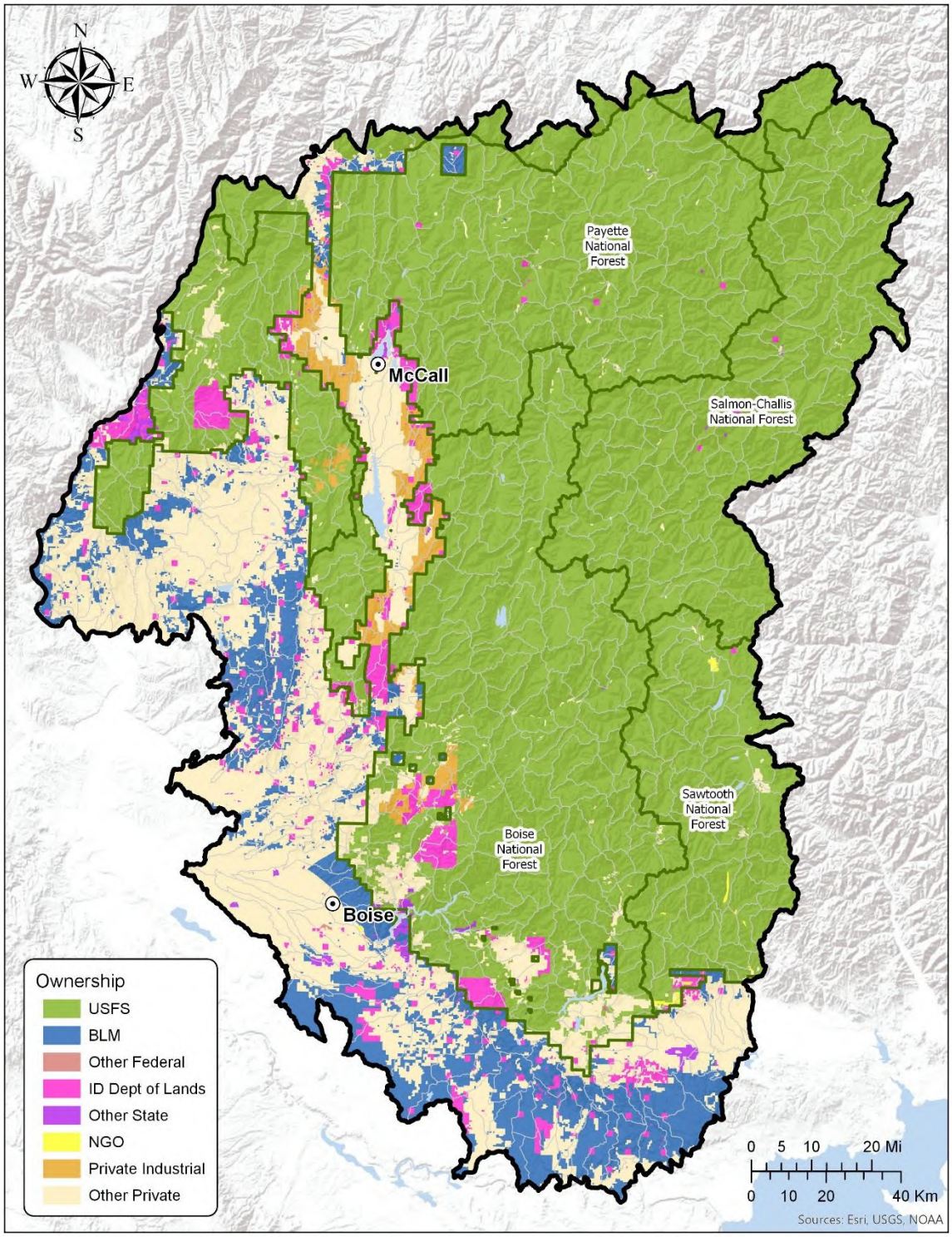

Figure 1. Land tenures in the southern Idaho shared stewardship study area. See figure 2 for USFS protected lands including wilderness and roadless areas. BLM = Bureau of Land Management; NGO = non-governmental organization

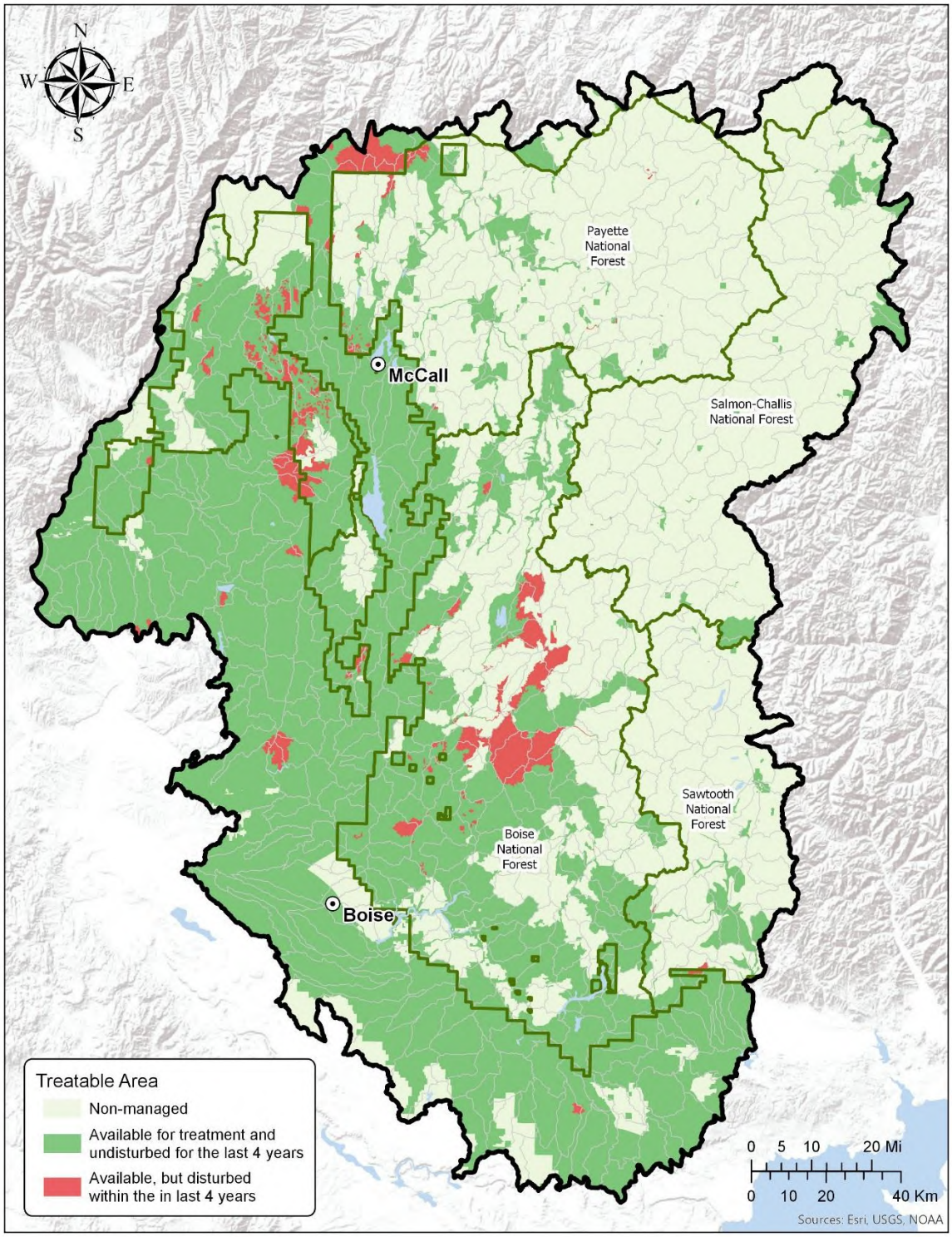

Figure 2. Areas available for treatment and disturbed in the last four years (2015-2018) in the southern Idaho study area. Lands available for treatment exclude roadless, wilderness and national designated areas on USFS lands.

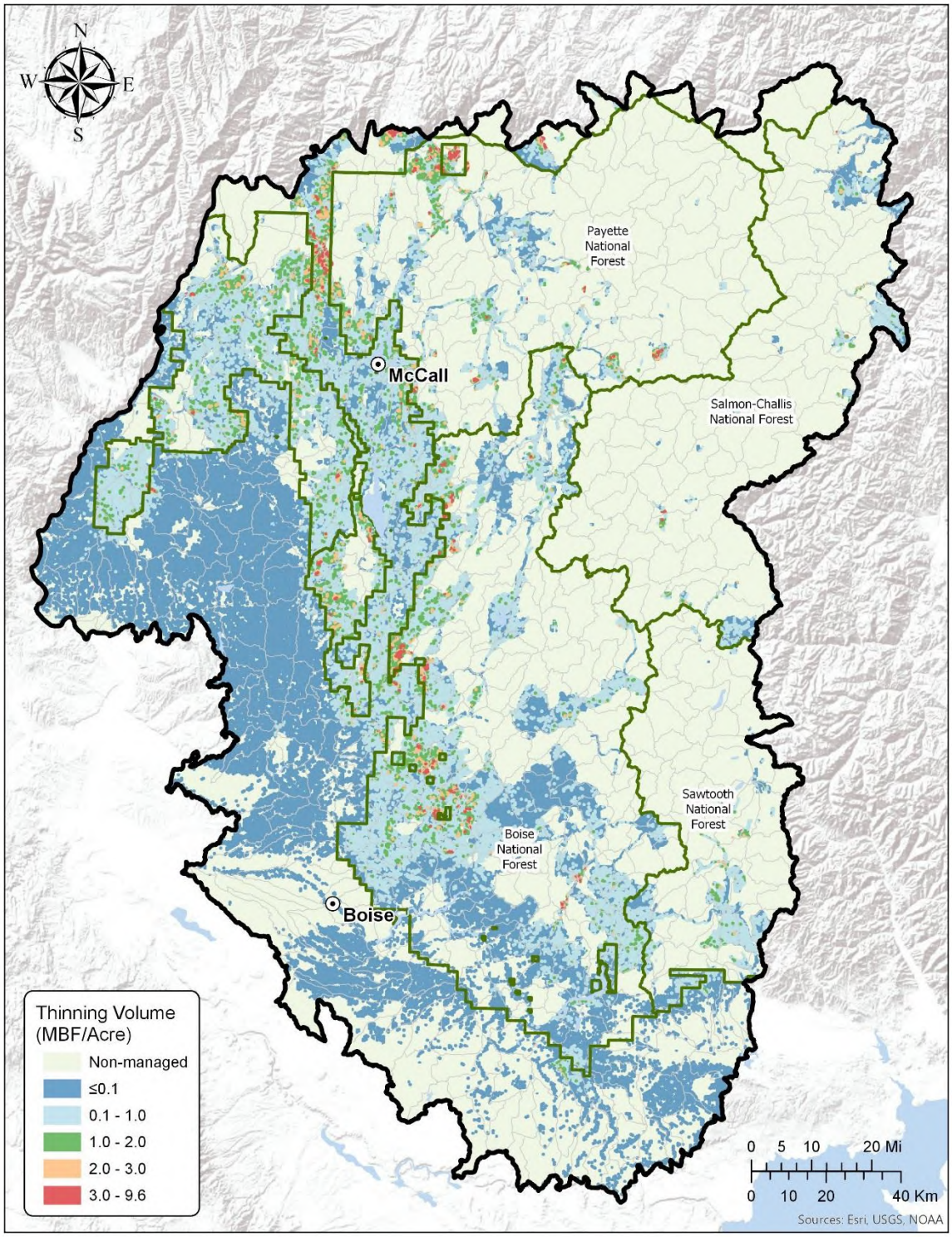

Figure 3. Merchantable live timber volume in areas available for mechanical treatment (excludes USFS wilderness and roadless areas).

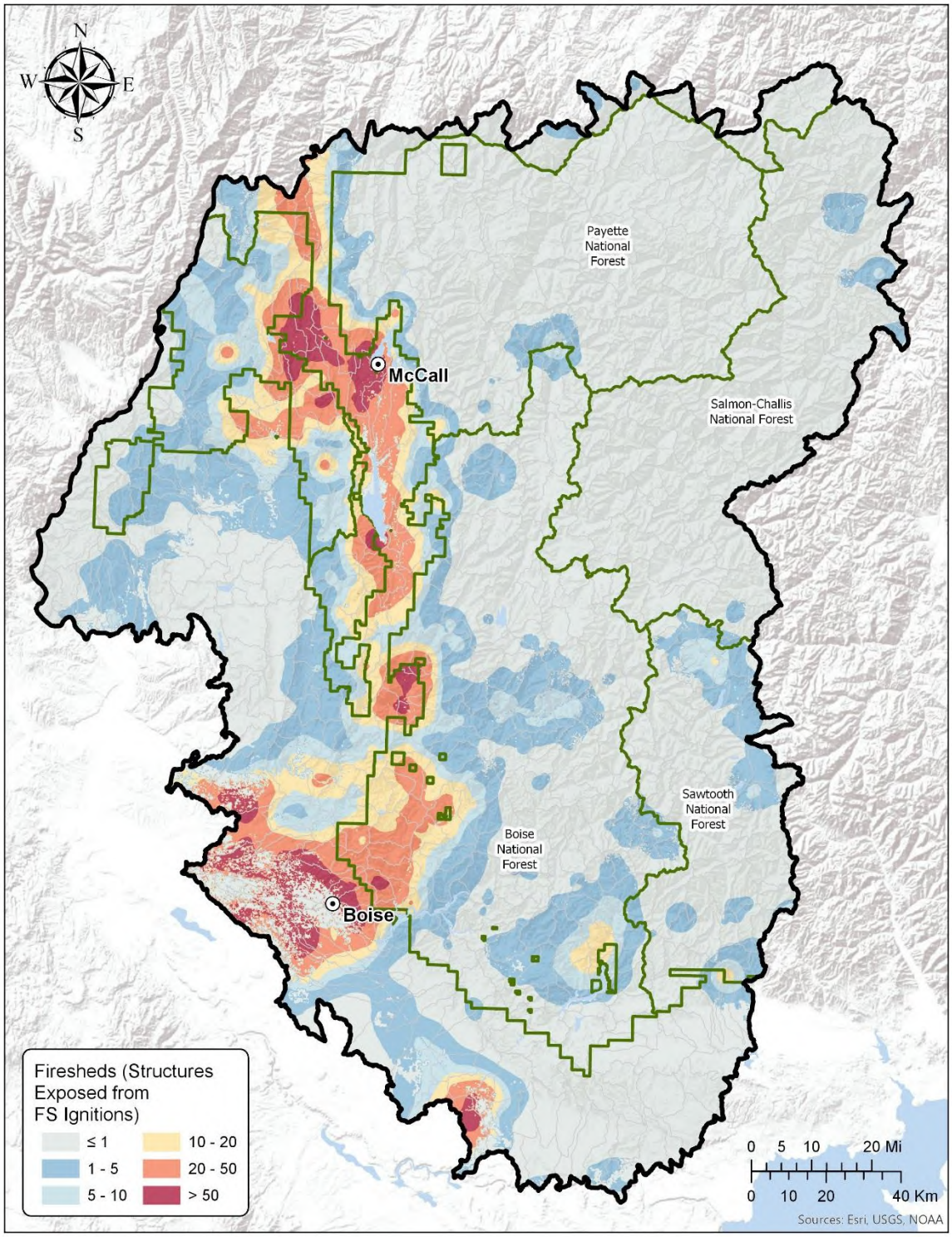

Figure 4. Wildfire exposure to structures in the wildland urban interface from ignitions on all land tenures.

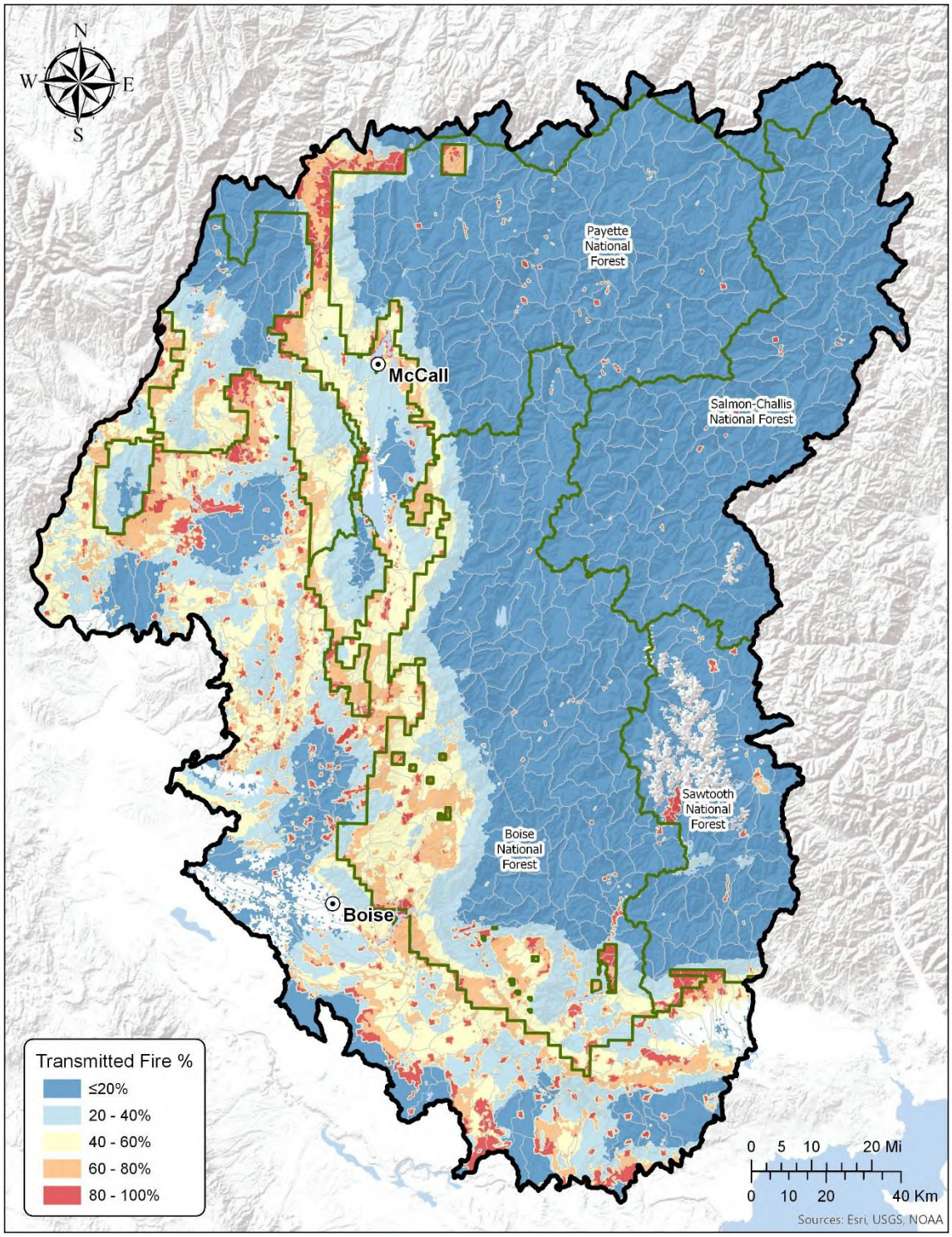

Figure 5. Percentage of wildfire that crosses ownership boundaries in the southern Idaho study area.

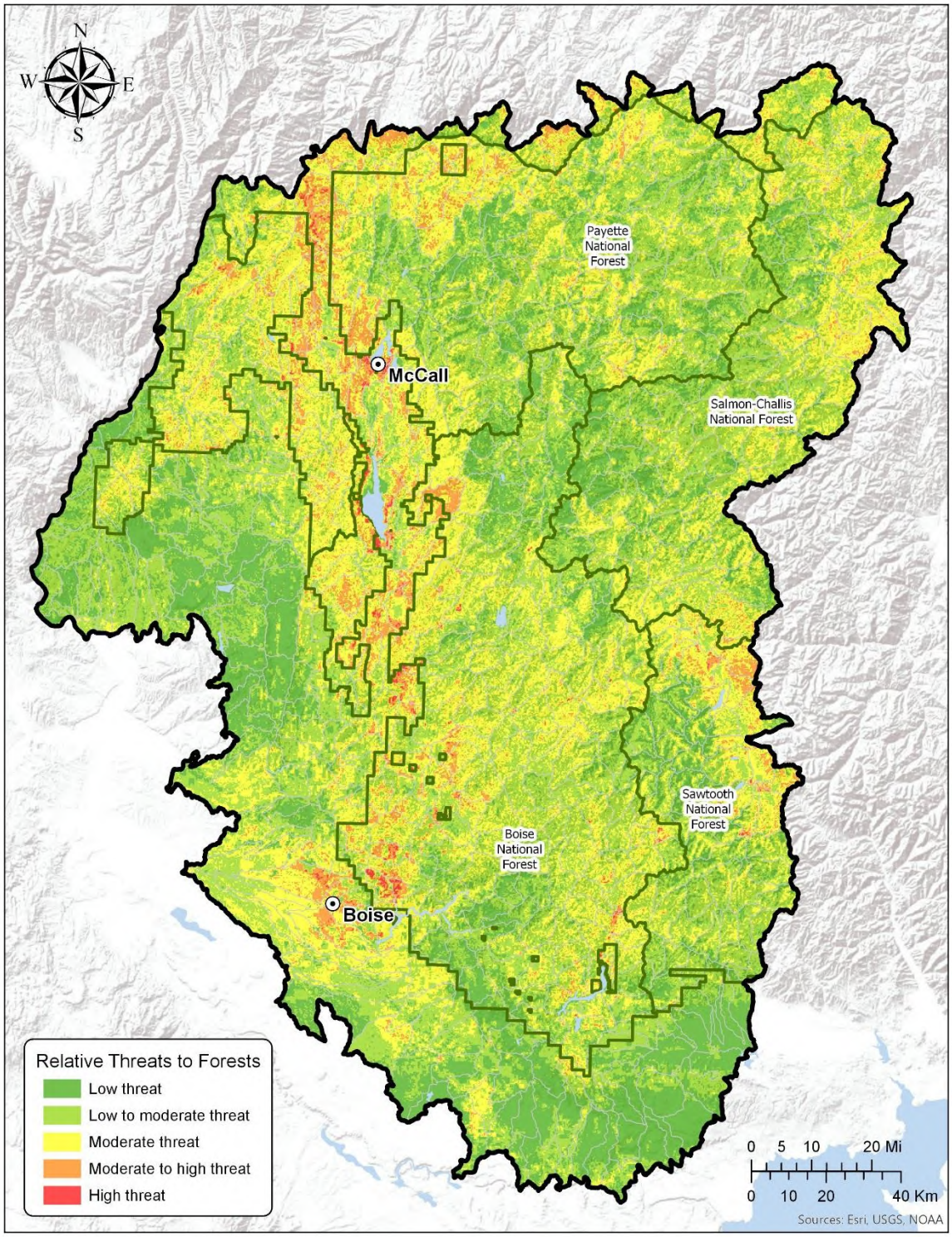

Figure 6. Relative threats from Idaho assessment.

II. Project area priorities and potential attainment

The LTD scenario planning model can be used to explore potential attainment in specified project areas assuming 100% treatment to explore variability among project areas in potential attainment. We simulated mechanical treatment in 487 project areas in southern Idaho, treating 1000% of the project area lands available for commercial treatment on any land tenure. We ran simulations for four different priorities: 1) reduce relative threats, 2) reduce wildfire exposure to structures in the wildland urban interface, 3) maximize merchantable timber volume, and 4) reduce transmission of wildfire across land tenures. Potential attainment varies among project areas for each priority (Figs. 7-10).

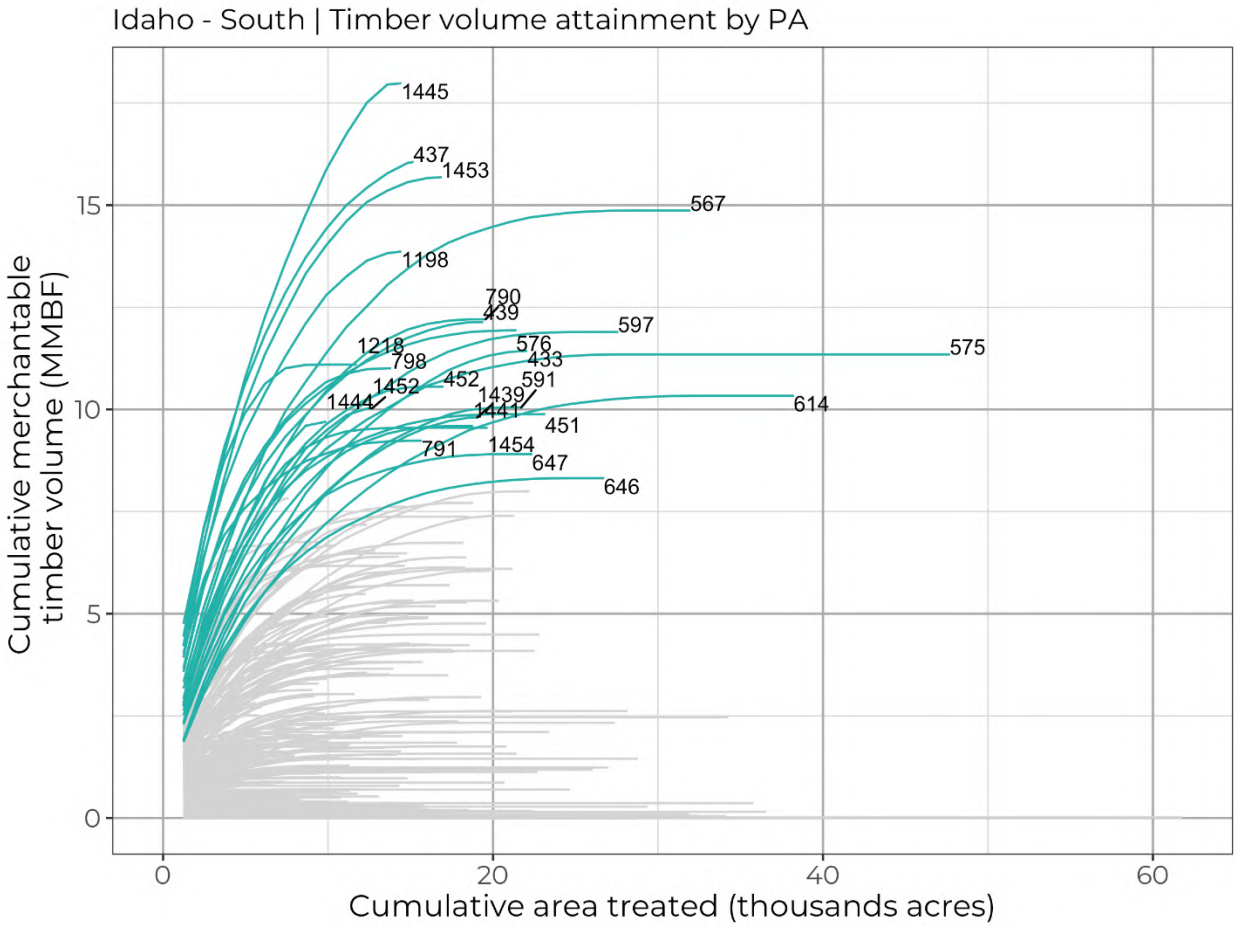

Figure 7. Potential cumulative merchantable timber volume generated with increasing area treated when prioritizing timber volume and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

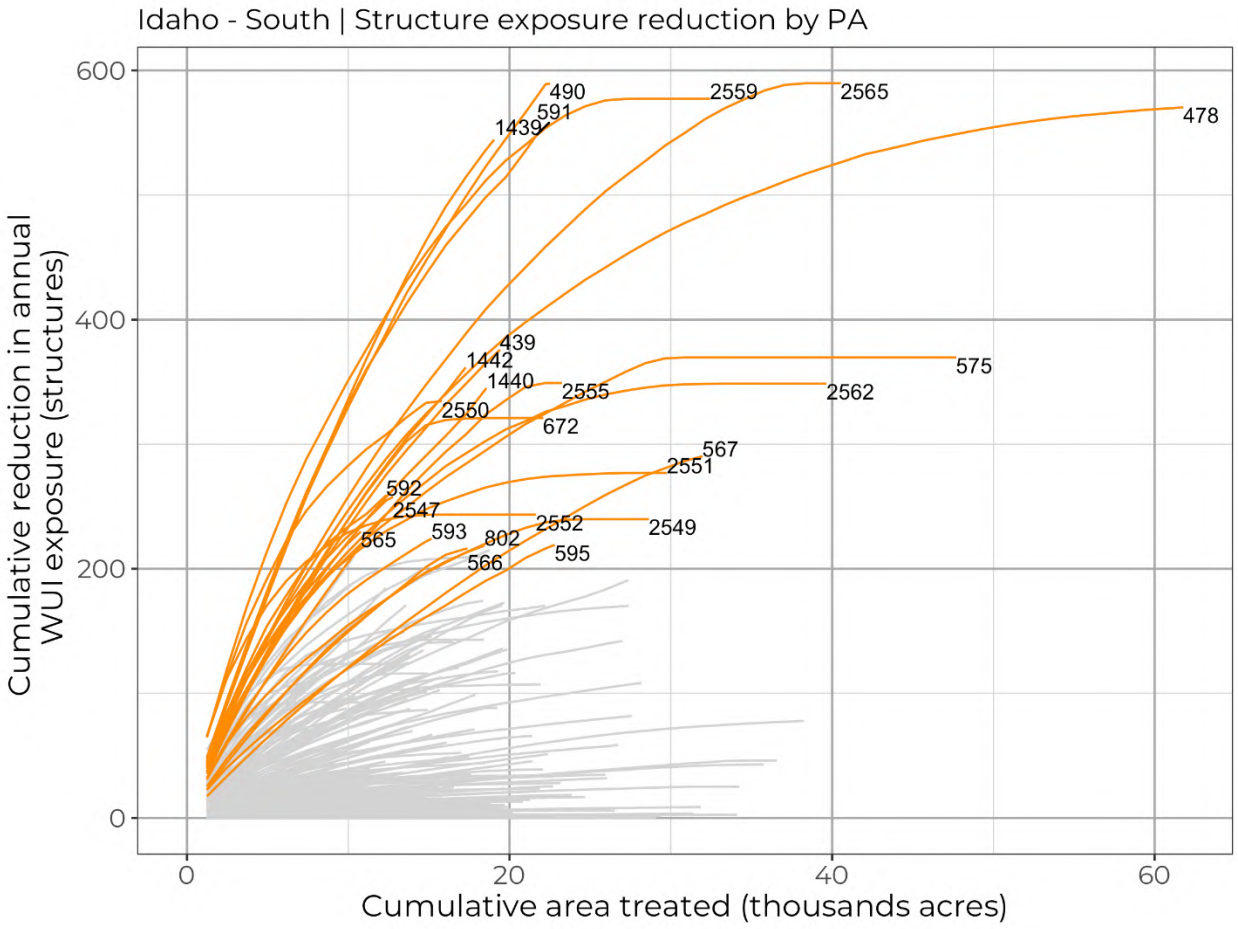

Figure 8. Potential cumulative reduction in structure exposure to wildfire in the wildland urban interface (WUI) generated with increasing area treated when prioritizing structure exposure and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

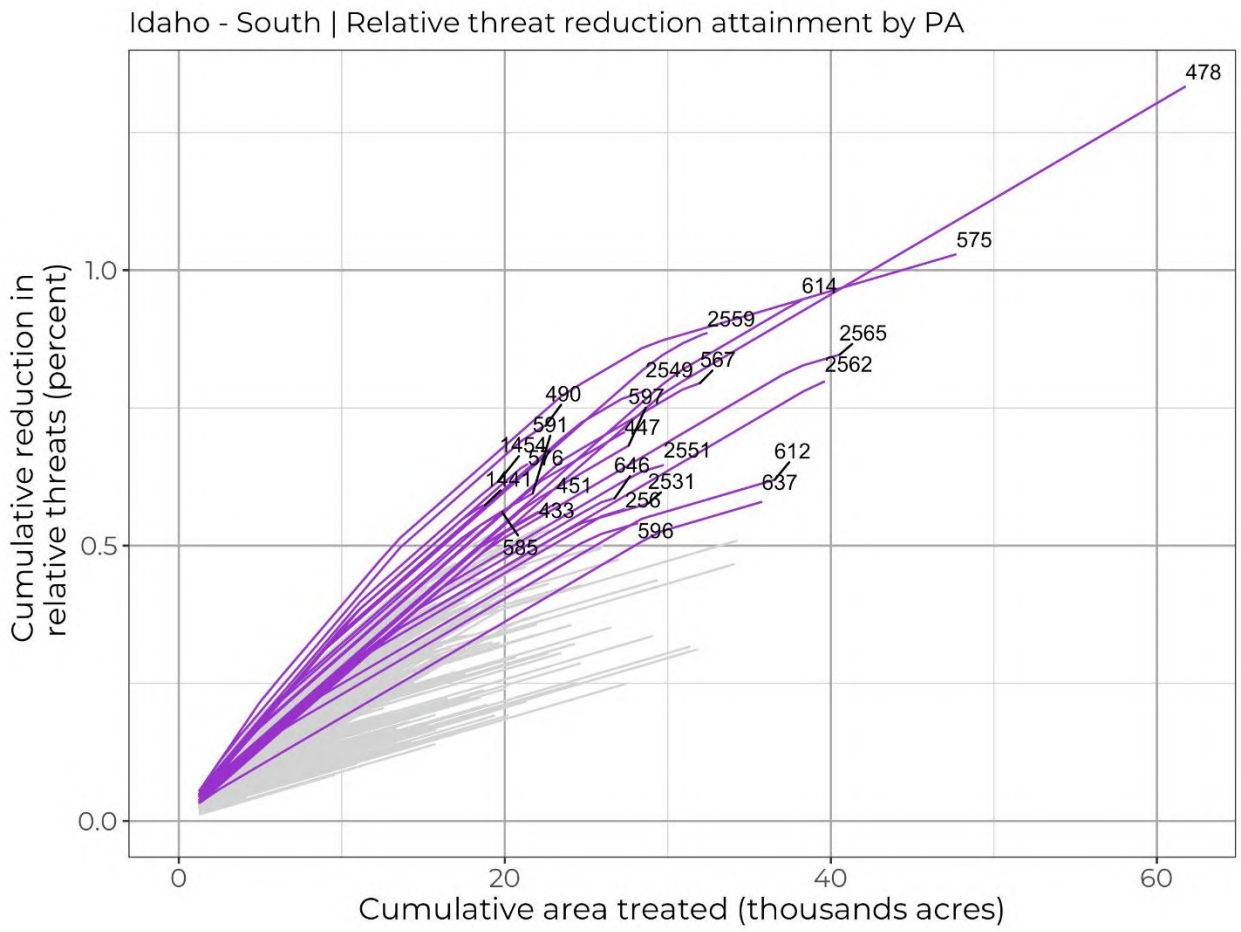

Figure 9. Potential cumulative reduction in relative threats with increasing area treated when prioritizing relative threats and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

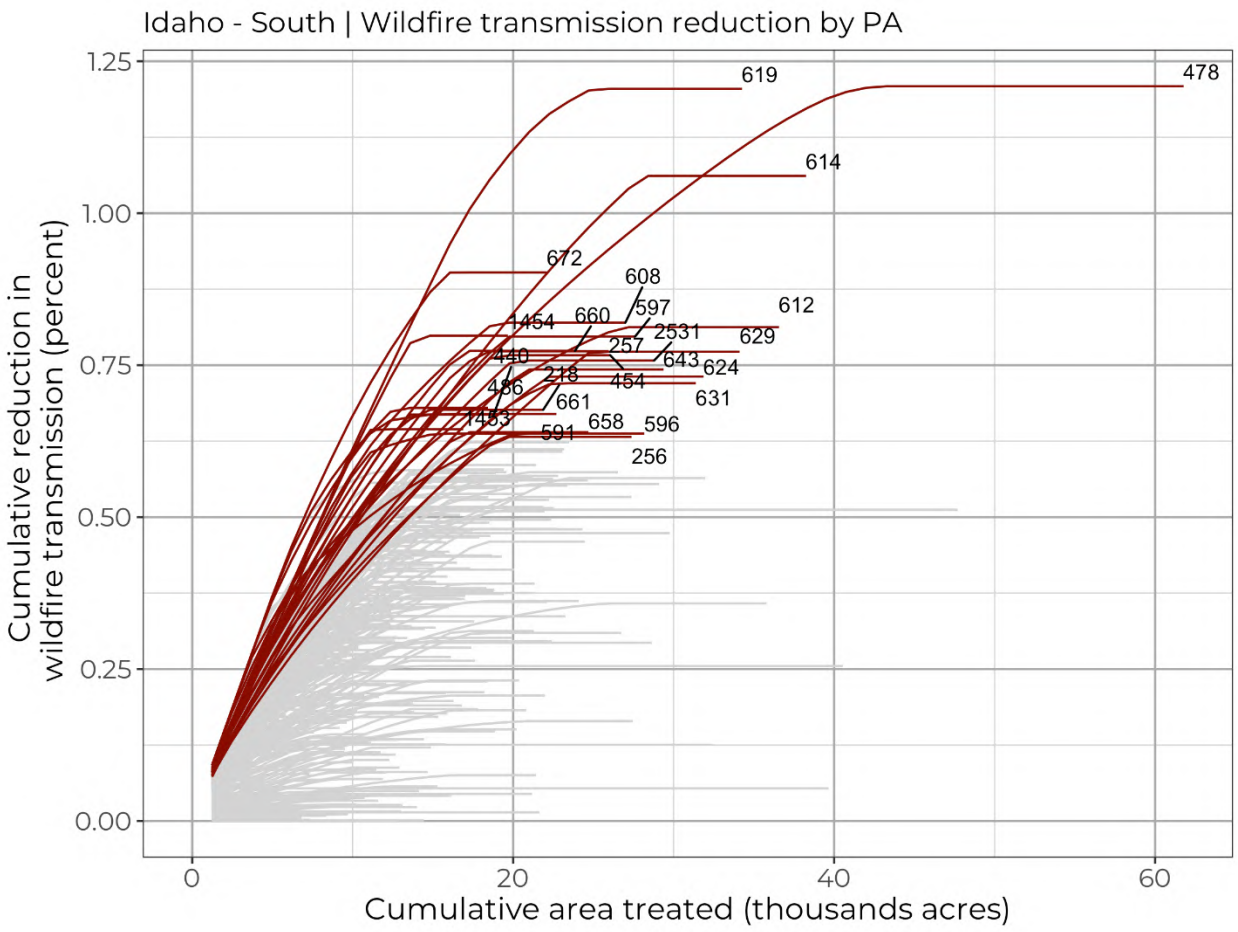

Figure 10. Potential cumulative reduction in wildfire transmission across land tenrues with increasing area treated when prioritizing wildfire transmission and treating 100% of the project area. Each line indicates a project area; numbers indicate project area number. The top 25 projects are indicated in color.

Again using the LTD scenario planning model we simulated mechanical treatment in 323[3] project areas in Idaho, treating 5000 acres within each project on lands available for commercial treatment on any land tenure. We ran simulations for four different priorities: 1) reduce relative threats, 2) reduce wildfire exposure to structures in the wildland urban interface, 3) maximize merchantable timber volume, and 4) reduce transmission of wildfire across land tenures. Attainment varies as different objectives are prioritized for treatment (Figs. 11-18).

[3] In total 487 projects were treated at some capacity but only 323 of those could reach a 5000 acre treatment area; although total number of treated projects varied somewhat between priorities (454-487).

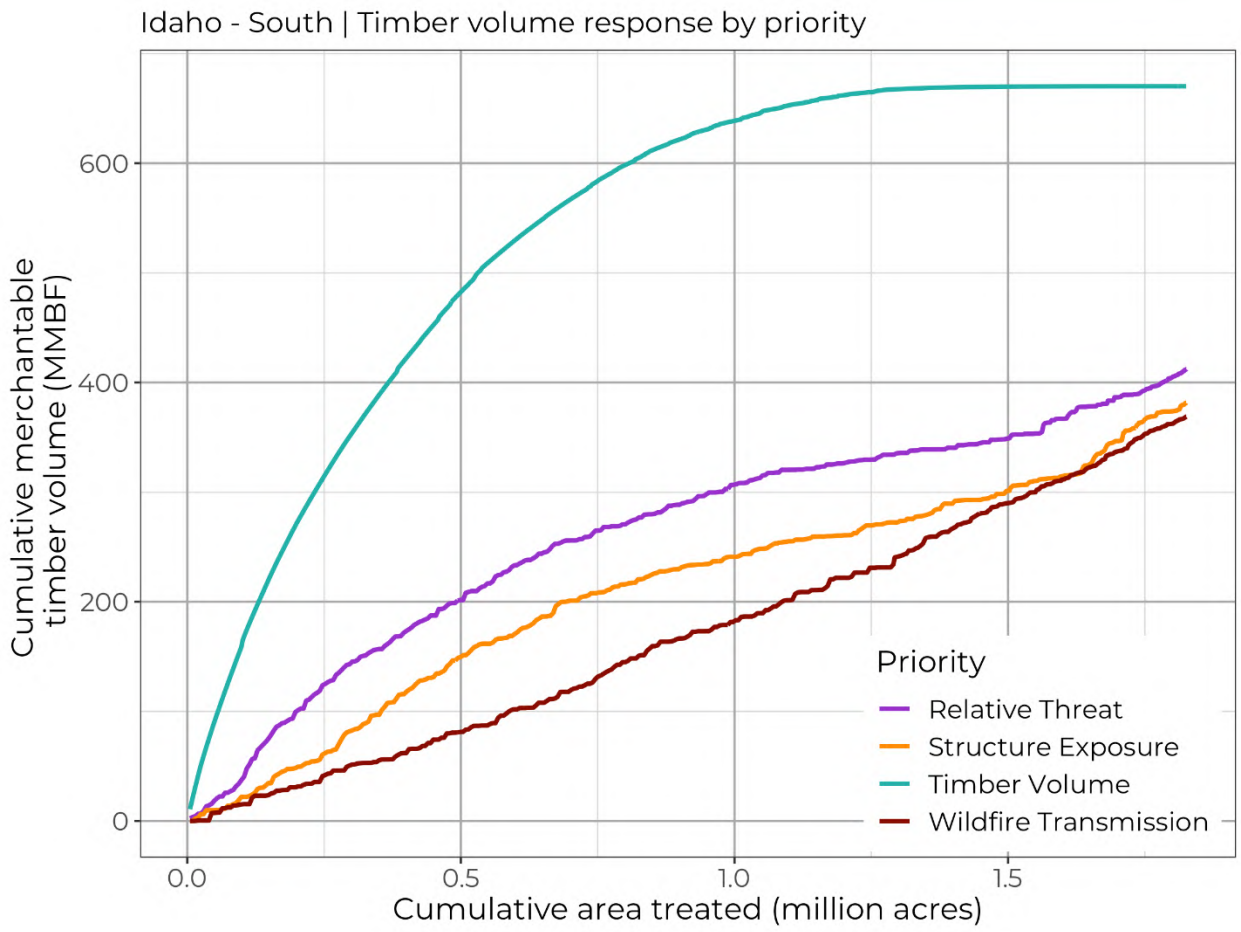

Figure 11. Cumulative merchantable volume generated with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

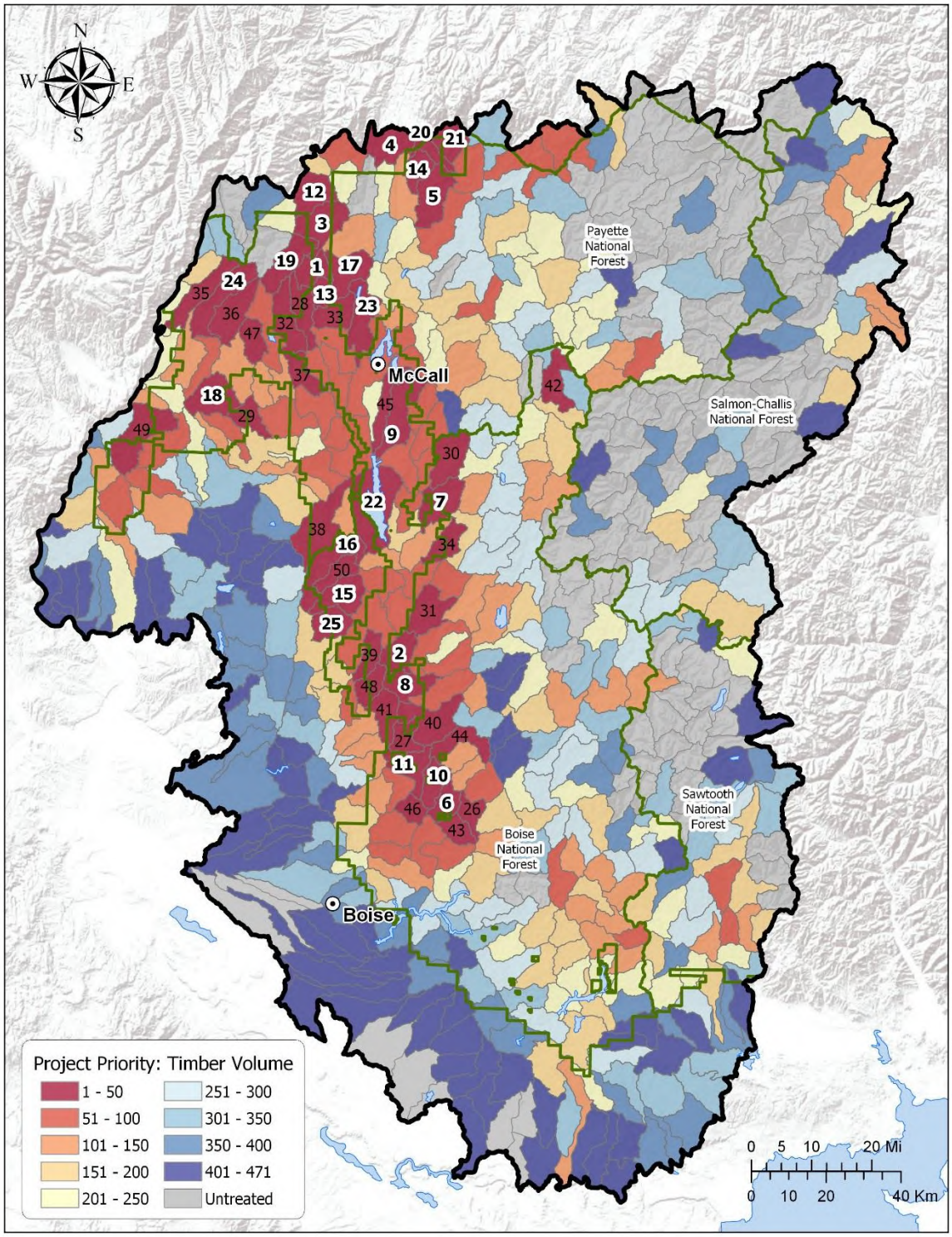

Figure 12. Project areas ranked from highest priority to lowest when prioritizing timber volume. The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

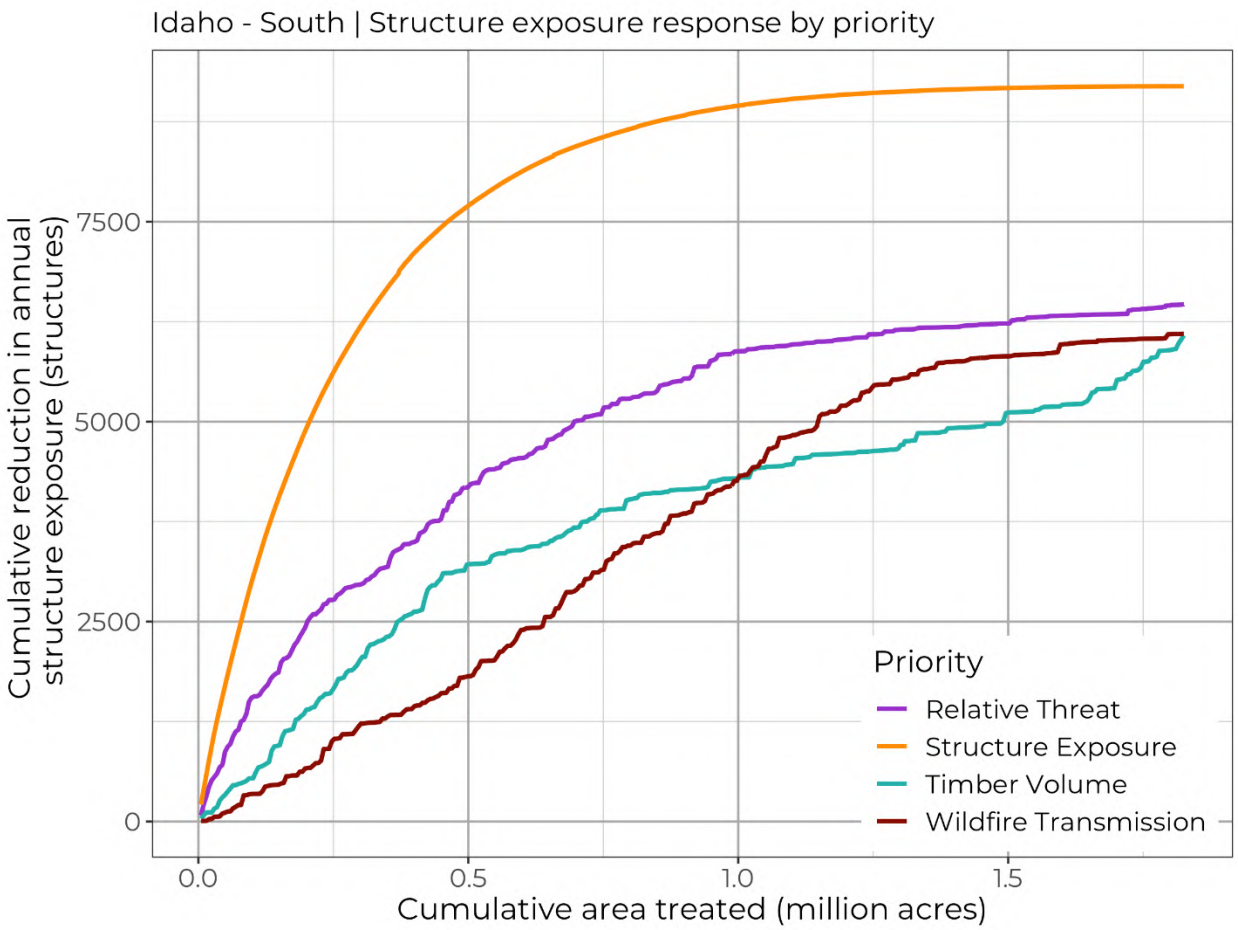

Figure 13. Cumulative reduction in structure exposure to wildfire in the wildland urban interface with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. 5000 acres of each project area are treated.

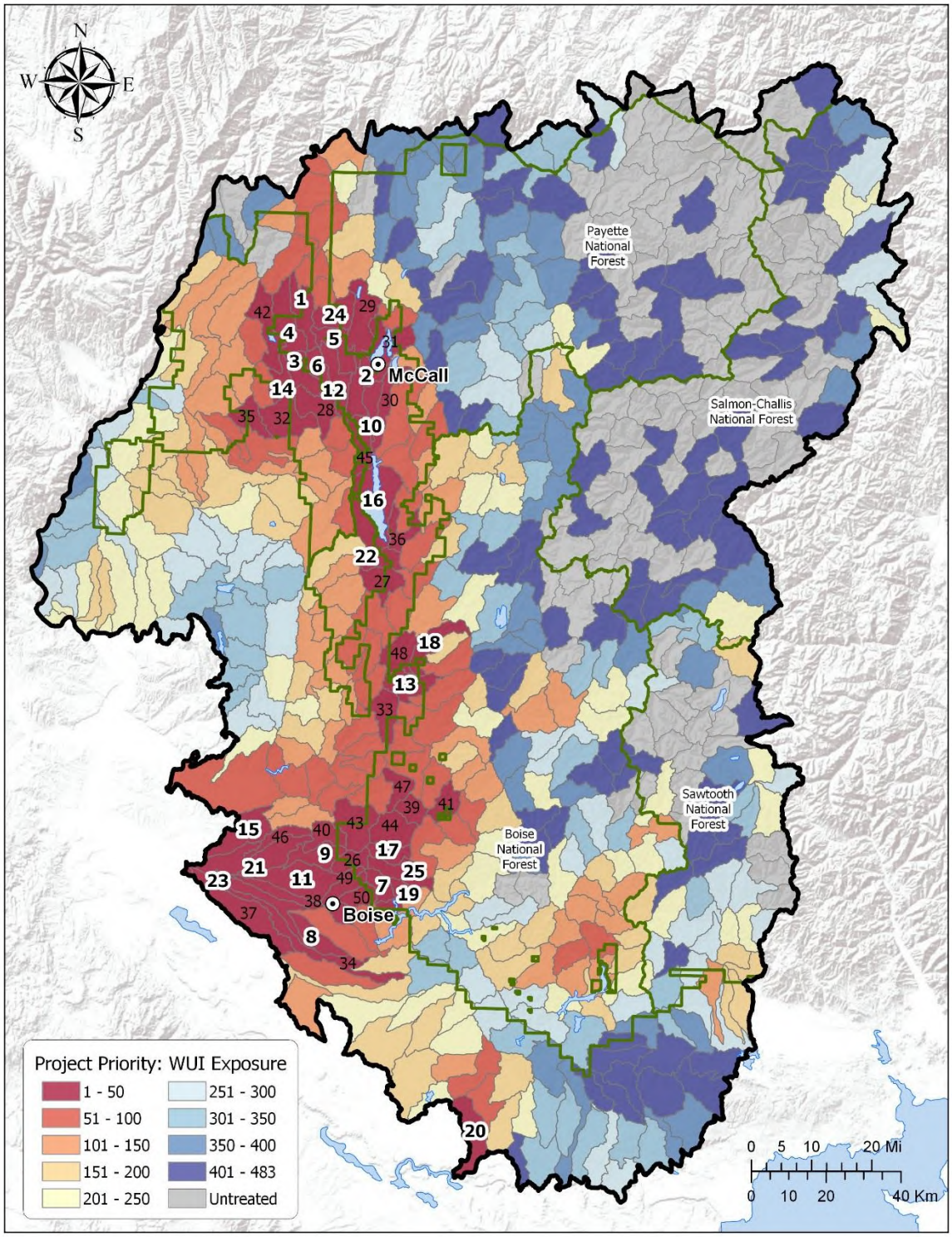

Figure 14. Project areas ranked from highest priority to lowest when prioritizing wildfire exposure to structures in the wildland urban interface (WUI). The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

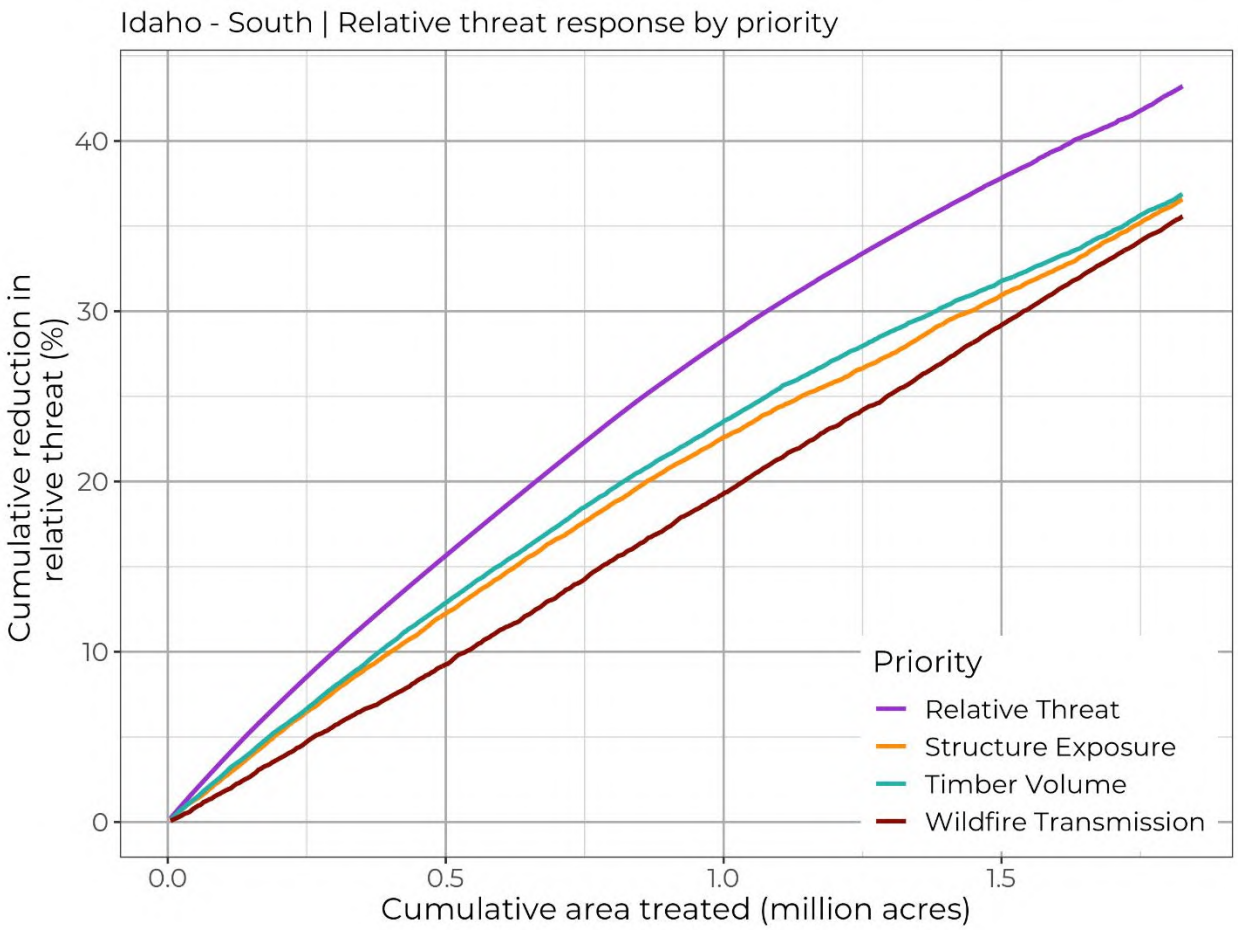

Figure 15. Cumulative reduction in relative threats with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

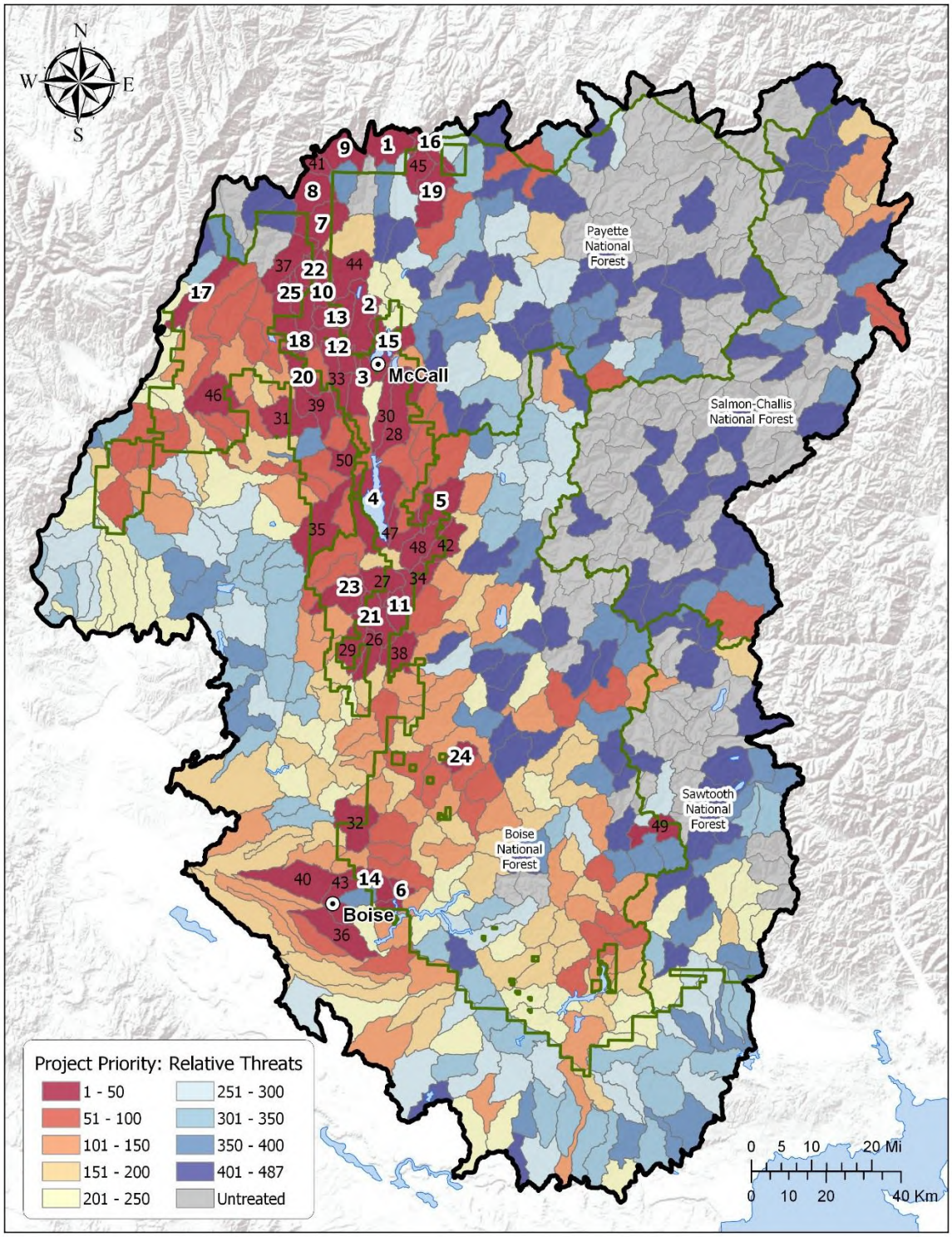

Figure 16. Project areas ranked from highest priority to lowest when prioritizing relative threats. The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

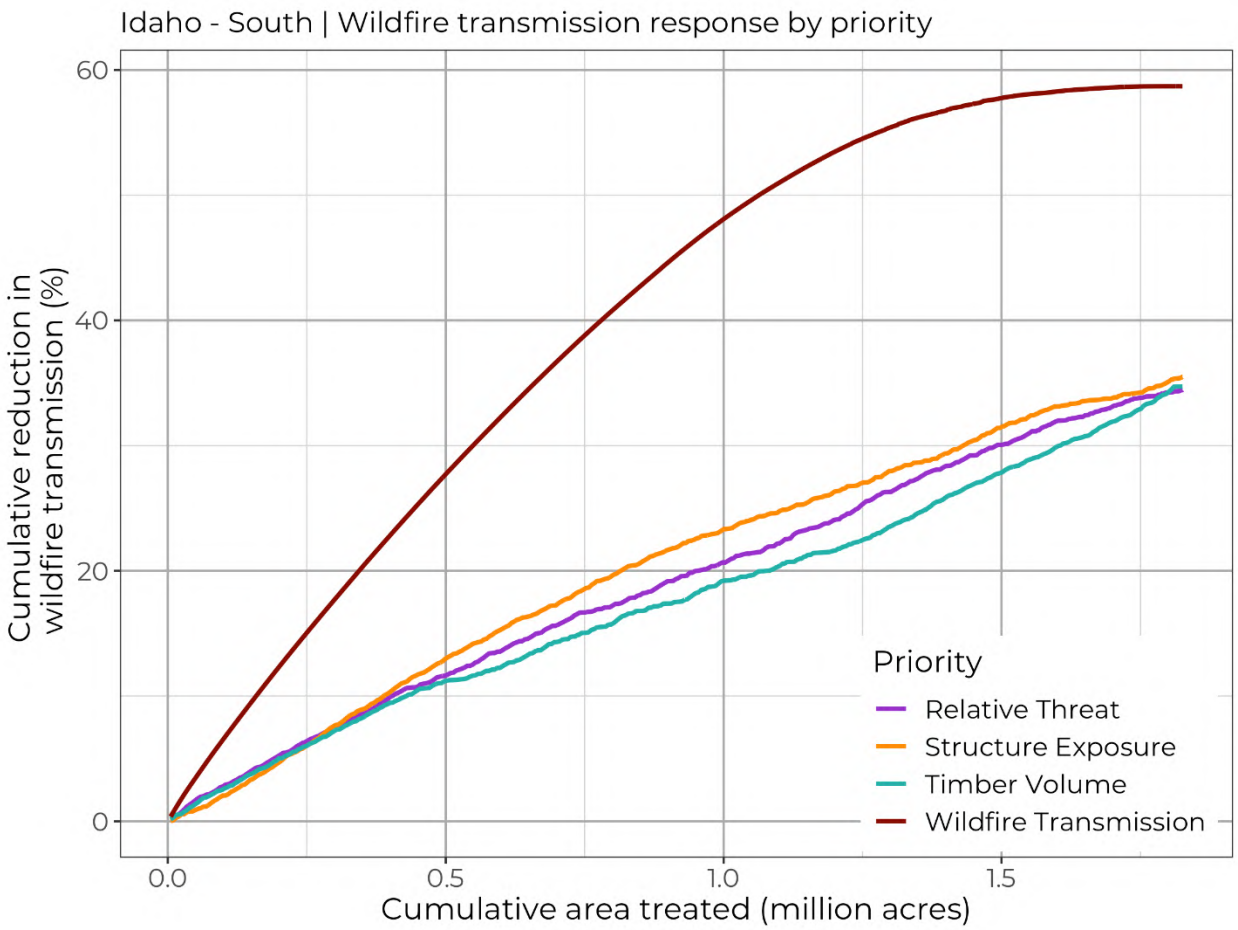

Figure 17. Cumulative reduction in wildfire transmission across land tenures with increasing area treated when different objectives are prioritized. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

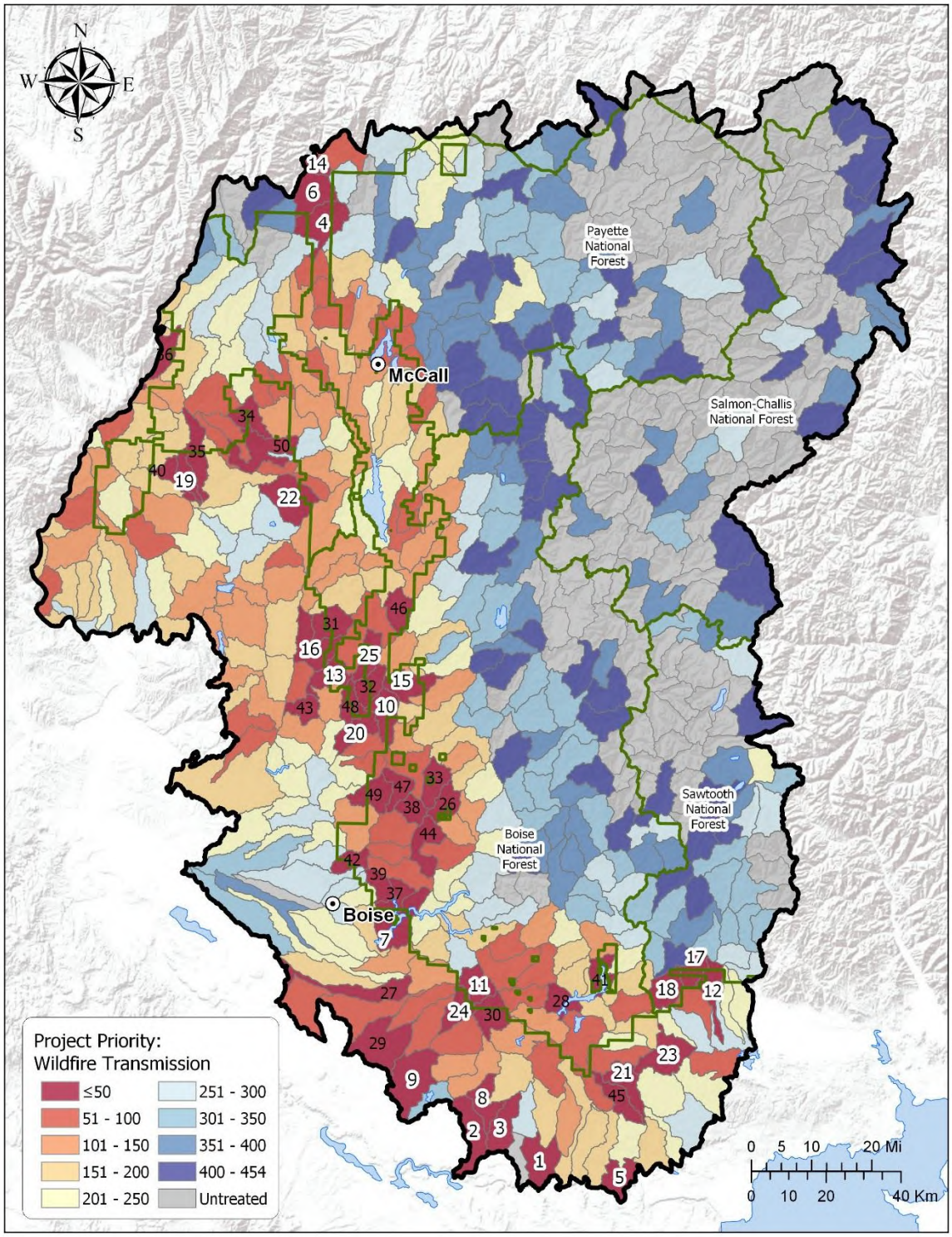

Figure 18. Project areas ranked from highest priority to lowest when prioritizing wildfire transmission across land tenures. The top 50 projects are labeled. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

If we prioritize treatments to address areas of high threats from the Idaho relative threat assessment, do we address other priorities related to wildfire and harvest volume (Fig. 19)?

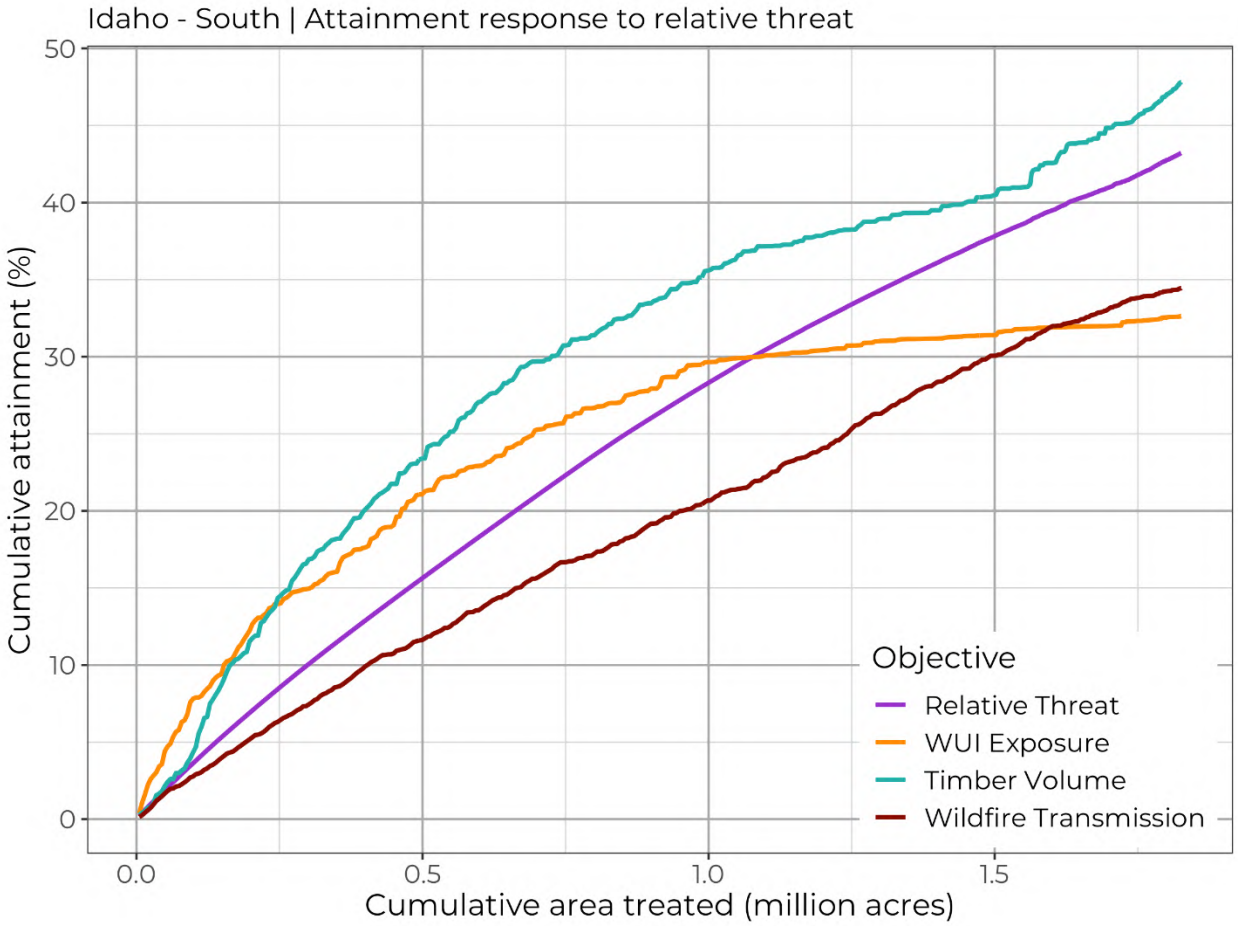

Figure 19. Cumulative attainment in project objectives across all land tenures with increasing area treated when you prioritize the Idaho relative threats assessment. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

If we prioritize treatments according to the Idaho relative threat assessment what is the effect on FS priorities for WUI risk reduction and efficiency of the timber program (Fig. 20)?

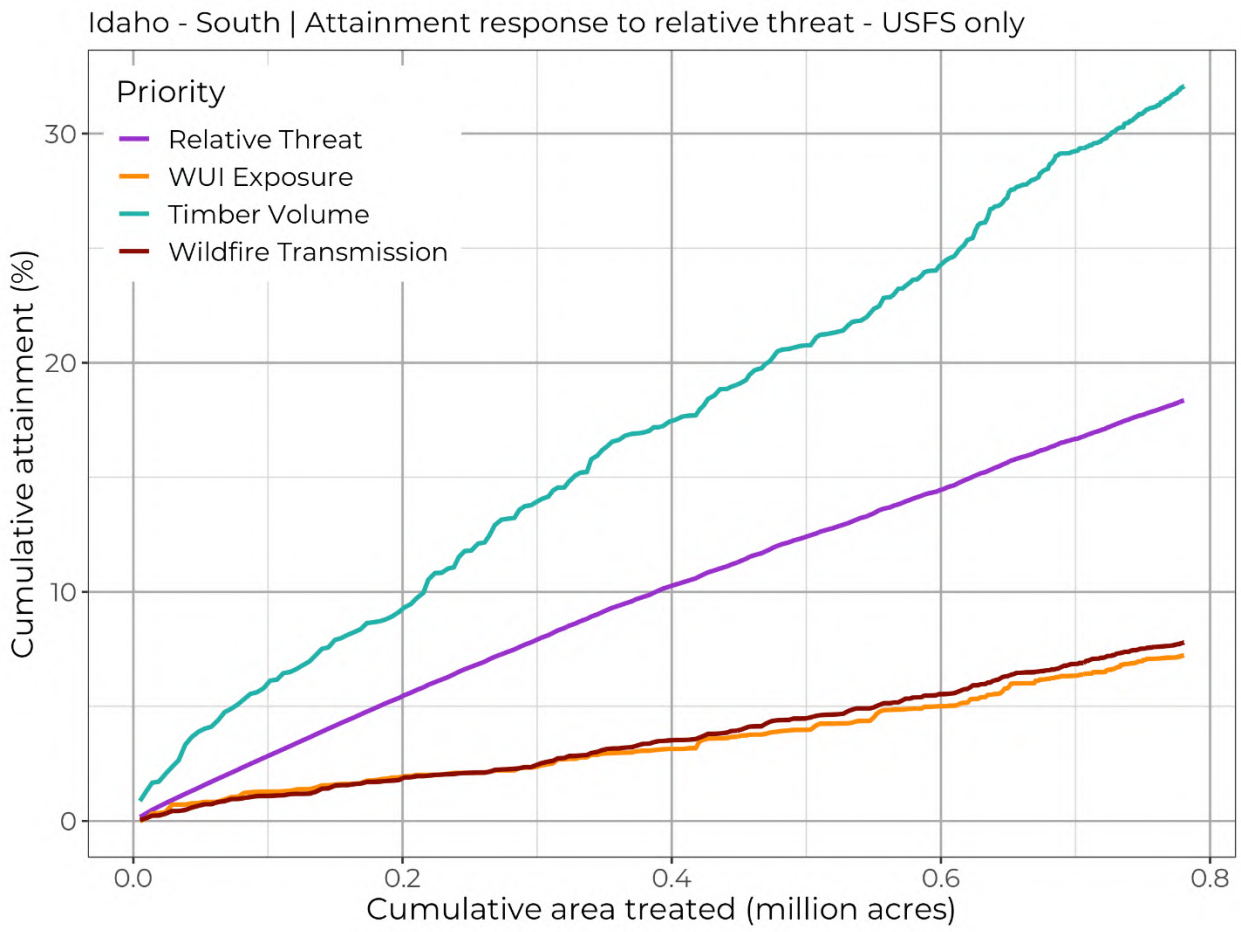

Figure 20. Cumulative attainment in project objectives across all USFS lands only with increasing area treated when you prioritize the Idaho relative threats assessment. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated.

III. Tradeoffs

We simulated 65 different treatment arrangements in each project that emphasized one or the other objective or both (~25,000 total) to examine the tradeoff between: 1) protecting structures and maximizing merchantable timber volume (Fig. 21); and 2) treating areas of areas of high risk for wildfire transmission and maximizing merchantable timber volume (Fig. 22); 3) reducing relative threats and maximizing merchantable timber volume (Fig. 23); and 4) reducing relative threats and protecting structures (Fig. 24). We treated 5000 acres of each project area on any land tenure across all 487[4] projects.

[4] In total 487 projects were treated at some capacity but only 323 of those could reach a 5000 acre treatment area; although total number of treated projects varied somewhat between priorities (454-487).

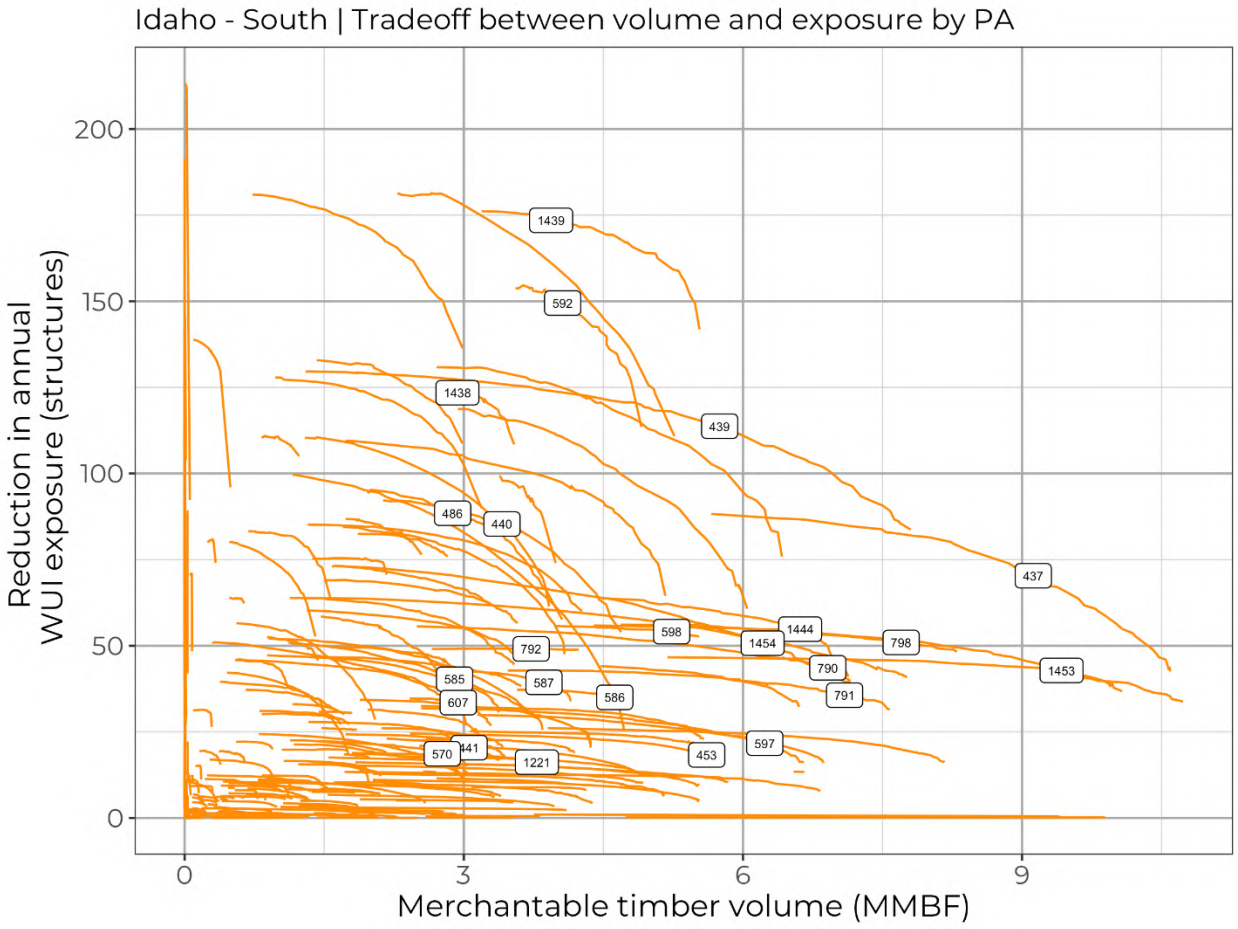

Figure 21. Tradeoff between maximizing merchantable timber volume versus protecting structures from wildfire exposure in the wildland urban interface (WUI) for projects in the southern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

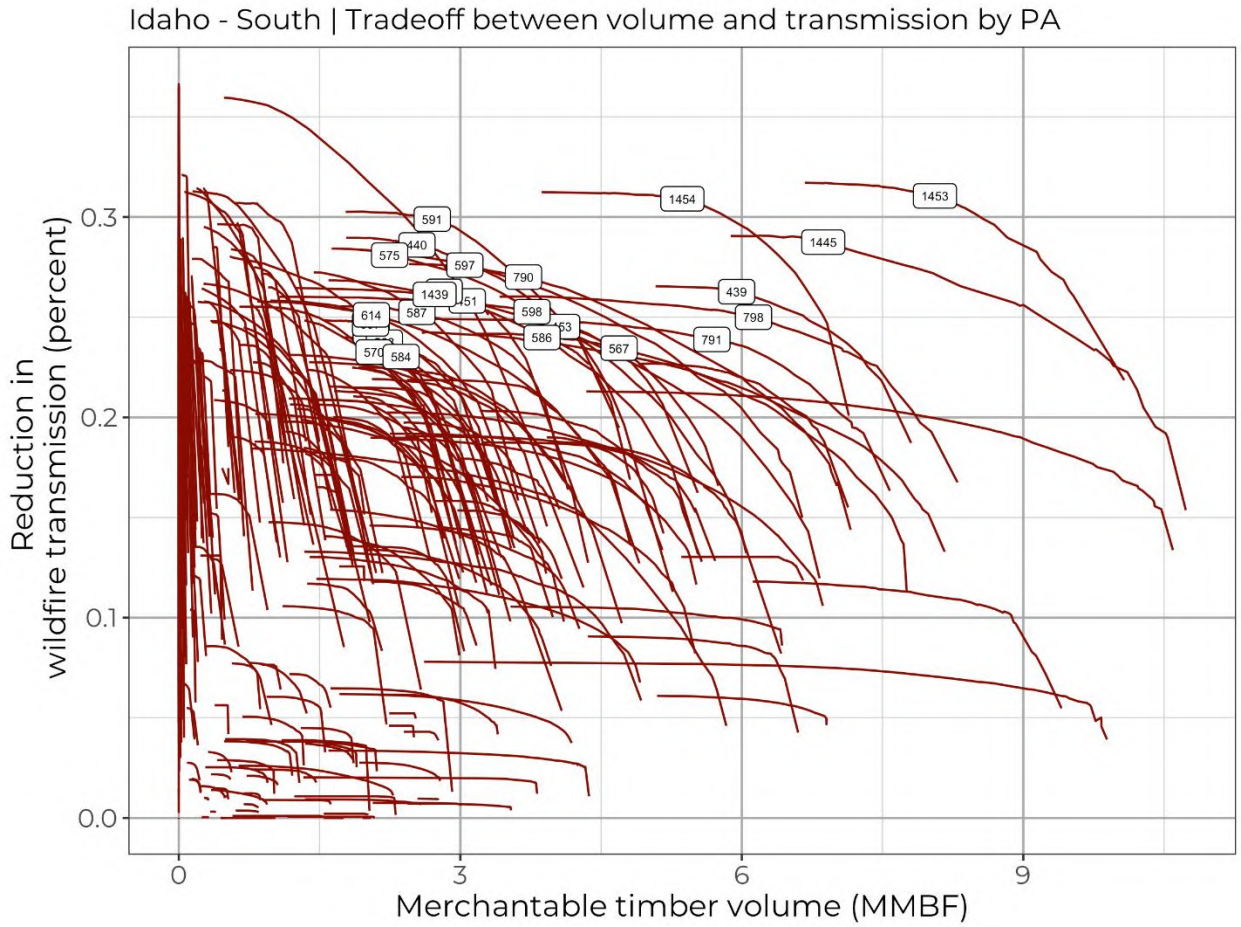

Figure 22. Tradeoff between maximizing merchantable timber volume versus reducing wildfire transmission across land tenures for projects in the southern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

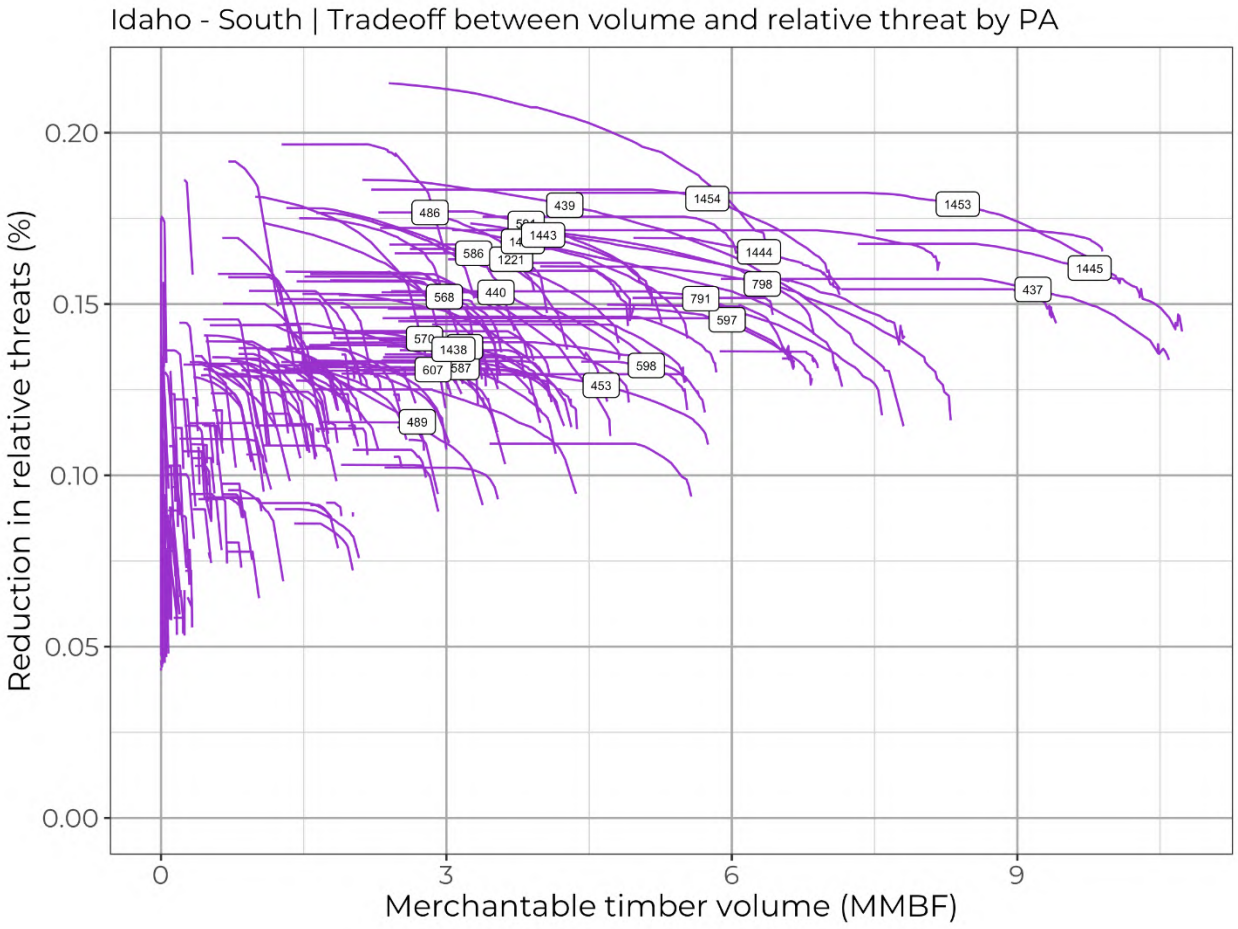

Figure 23. Tradeoff between maximizing merchantable timber volume versus reducing relative threats across land tenures for projects in the southern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

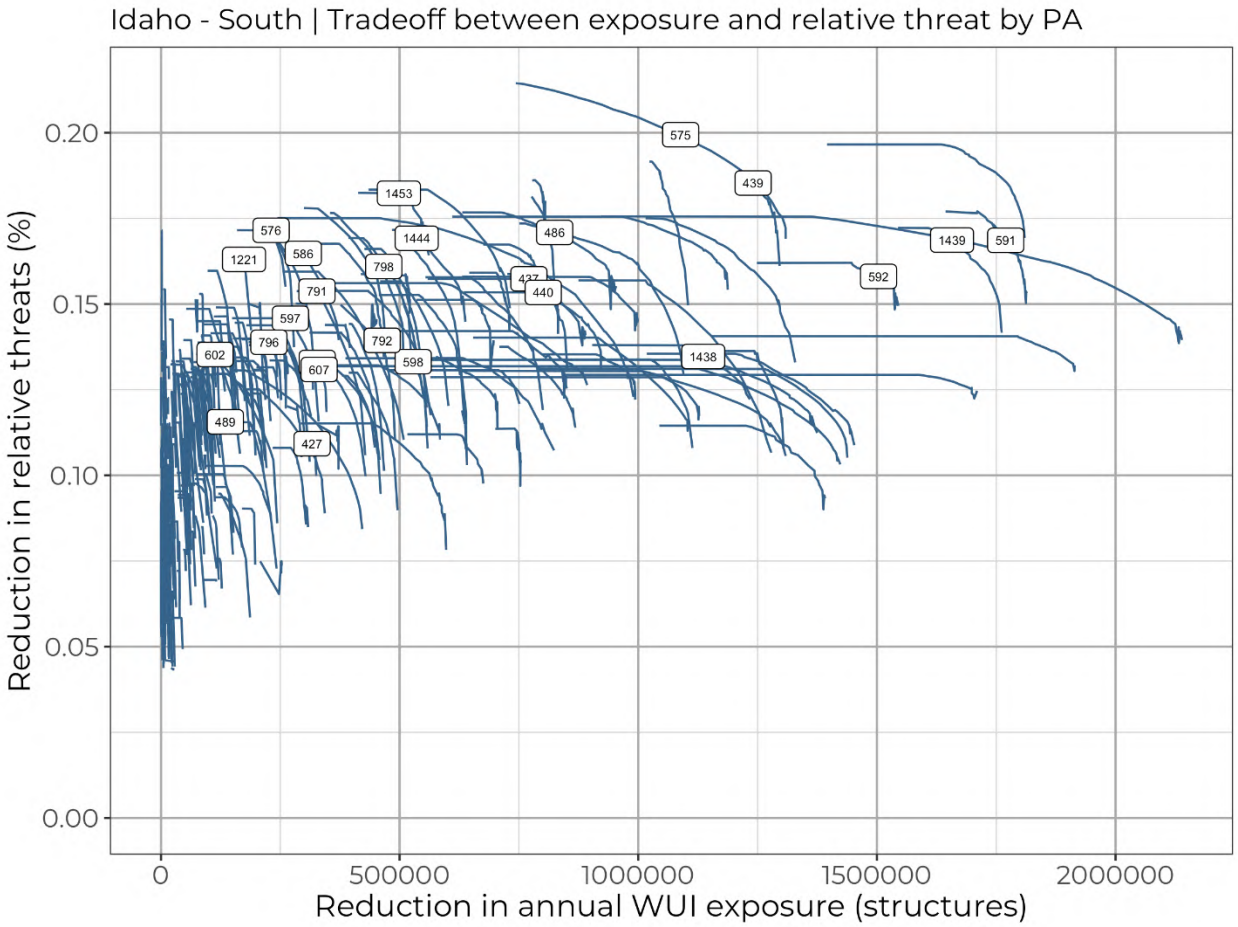

Figure 24. Tradeoff between reducing wildfire exposure to structures in the wildland urban interface (WUI) versus reducing relative threats across all land tenures for projects in the southern Idaho shared stewardship study area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Numbers indicate project number.

IV. Leveraging Collaborative Opportunities to Reduce Risk

We simulated treatments on all 487 project areas, treating 5000 acres of each project on any land tenure when prioritizing reduction in relative threats. These treatment solutions were then filtered to those collaborative projects where no one land tenure represented greater than 50% of the treated area. This resulted in 47 collaborative project opportunities (Fig. 25). These were then ranked from highest priority to lowest when prioritizing relative threats. When prioritizing treatments to address areas of high threat from the Idaho state assessment we can also assess how well we achieve other restoration objectives (Fig. 26).

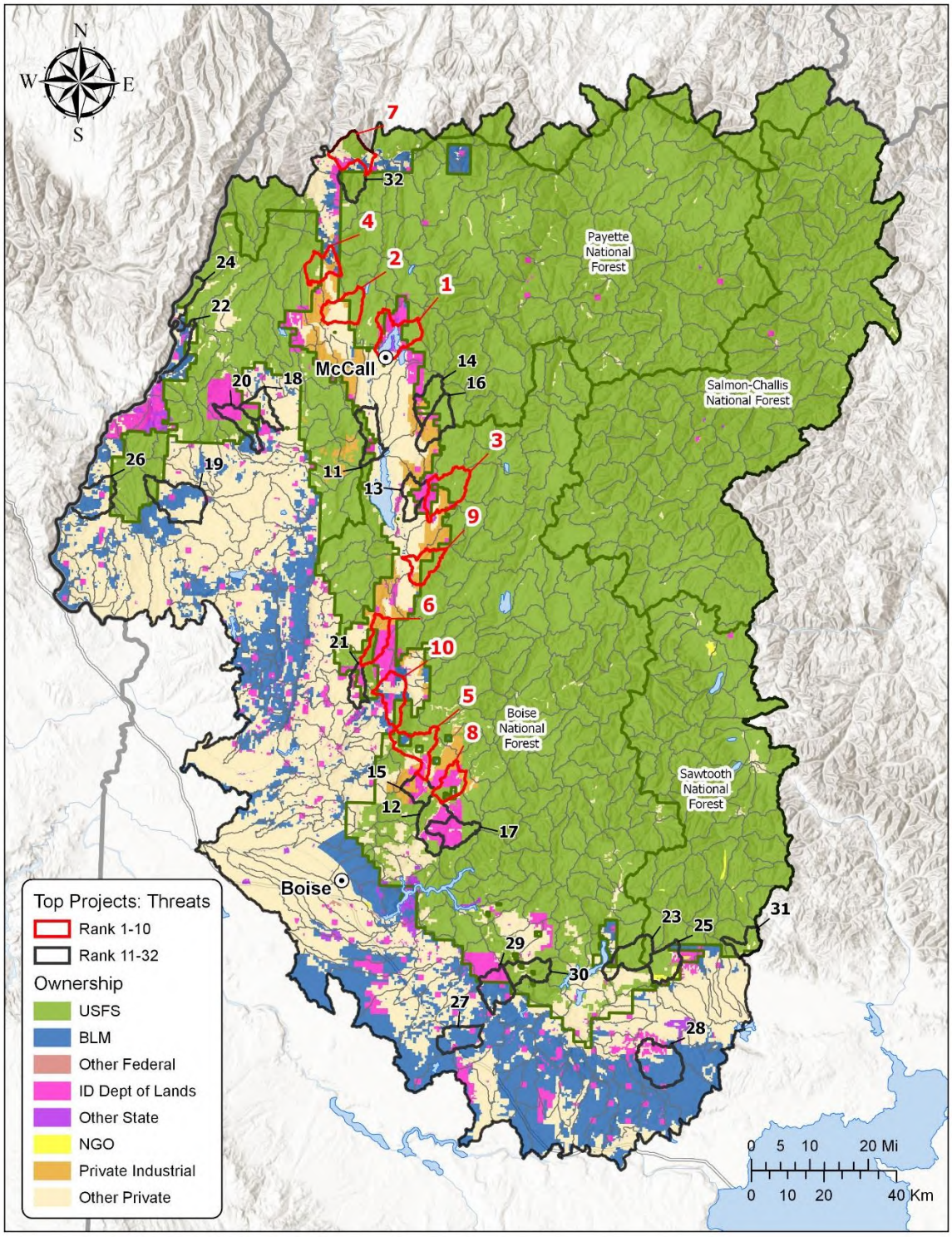

Figure 25. Top 32 project areas when prioritizing relative threats and filtering projects for collaborative opportunities where no single land tenure contributes more than 50% to the treatment area. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. BLM = Bureau of Land Management; USFS = US Forest Service; NGO = non-governmental organization.

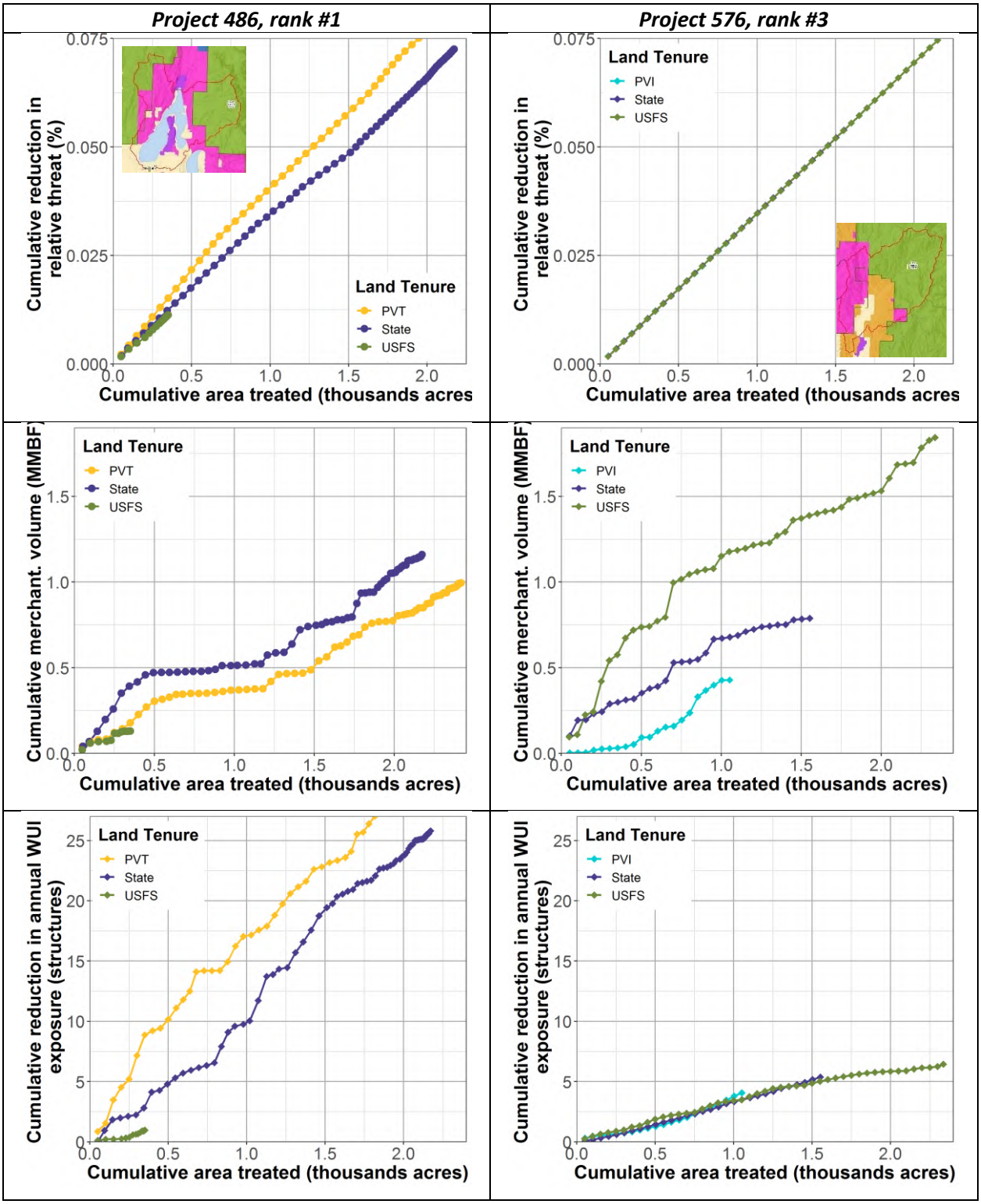
Project 486, rank #1
Project 576, rank #3
Cumulative reduction in relative threat (%)
Cumulative area treated (thousands acres
Land Tenure
PVT
State
USFS
PVI
Cumulative merchant. volume (MMBF)
Cumulative area treated (thousands acres)
Cumulative reduction in annual WUI exposure (structures)

Figure 26. Two of the top 32 project areas (#486 and #576) when prioritizing relative threats and filtering projects for collaborative opportunities. Stands are available for treatment on any land tenure; 5000 acres of each project area are treated. Attainment graphs show attainment by land tenure for the prioritized objective (top row) and attainment in other restoration goals. Graphs are truncated to highlight state and USFS lands. BLM = Bureau of Land Management; PVI = Private Industrial; PVT = Private; USFS = US Forest Service.