

Northwest US Region SIC Climate Smart Forestry Regional Assessment

January 31, 2023



The 2022 SFI Forest Management Standard includes a new “Climate Smart Forestry” Objective 9, which sets expectations for SFI-certified organizations related to climate change risk assessment, adaptation, and carbon management. Objective 9 also introduces new opportunities for engagement and collaboration via the SFI Implementation Committees (SICs).

To facilitate SIC coordination on Objective 9, SFI developed a [playbook](#) and hosted a national online workshop on March 31, 2022, to discuss how Climate Smart Forestry indicators could be addressed collaboratively.

On January 31, 2023, SFI hosted a Northwestern US Regional Workshop specifically to help SICs exchange ideas and discuss regional information relevant for SFI-Certified Organizations to meet the requirements in Performance Measures 9.1 and 9.2 of the Climate Smart Forestry objective.

Performance Measure 9.1 Certified Organizations shall individually and/or through cooperative efforts involving SFI Implementation Committees or other partners identify and address the climate change risks to forests and forest operations and develop appropriate adaptation objectives and strategies. Strategies are based on best scientific information.

Performance Measure 9.2 Certified Organizations shall individually and/or through cooperative efforts involving SFI Implementation Committees or other partners identify and address opportunities to mitigate the effects associated with its forest operations on climate change.

The workshop was facilitated by representatives of the USDA Forest Service:

- **Dr. Jessica Halofsky**, Director, USDA Northwest Climate Hub, US Forest Service, Pacific Northwest Research Station
- **Dr. Holly Prendeville**, Coordinator, USDA Northwest Climate Hub, US Forest Service, Pacific Northwest Research Station
- **Dr. Thomas Timberlake**, Climate Change and Science Coordinator, Western Wildland Environmental Threat Assessment Center, US Forest Service, Pacific Northwest Research Station

The workshop helped SICs:

- Discuss potential climate change risks to SFI-Certified Organizations and develop a regional risk assessment
- Identify potential adaptation actions to address priority climate impacts, and in some cases, offer mitigation opportunities

The full agenda for the meeting can be found in **Appendix 1**.

The workshop was attended by SIC Participants representing four states – Oregon, Washington, Idaho and Montana – consisting of organizations certified to the SFI Forest Management and/or Fiber Sourcing standards. A full list of attendees can be found in **Appendix 2**.

The process of the workshop was to:

1. Identify climate change risks to forests
2. Prioritize risks utilizing a matrix
3. Identify opportunities to adapt to risks

1. **Climate Change (Impacts) Risks were identified** using regional climate change projections and vulnerabilities summarized by the USDA Northwest Climate Hub, and through discussions with workshop participants. The Northwestern US climate change risks identified were:
 1. **Warmer Temperatures** - Temperatures in the Northwest are project to increase 4.5 to 5.6°F by the middle of the century, depending on global greenhouse gas emissions, with the greatest warming expected to occur during summer.
 2. **Milder Winters** - The winter season will be shorter and milder. There will be fewer cool degree days, which can affect bud break. At low to mid elevations, there will be less precipitation falling as snow, as well as reduced snow cover and depth.
 3. **Changing Precipitation** – Annual precipitation is projected to increase by the end of the century. Seasonally, precipitation will likely increase in the winter, but there is a potential for reduced summer precipitation. Intense precipitation events will likely become more frequent. The timing and amount of stream flow is expected to change, with increased peak flows in winter and decreased low flows in summer.
 4. **Extreme Events** – Heavy rainfall events are expected to become more severe, with a greater length of time between precipitation events. In some areas, heavy rainfall can lead to flooding and/or more landslides. Extreme heat events are also likely to become more frequent. Early warming in spring followed by frost can cause bud damage.
 5. **Altered soil moisture and increased drought risk** – Warmer temperatures and altered precipitation will interact to change soil moisture patterns throughout the year, with the potential for both wetter and drier conditions depending on the location and season. Forest vegetation will likely experience increased moisture deficit and drought stress during the summer, potentially reducing tree growth and forest productivity.
 6. **Increases in fire area burned** – Warmer temperatures reduced summer precipitation, and drier conditions will lead to longer fire seasons and increased area burned.
 7. **Increases in insect pests and forest pathogens** – Certain insect pests and pathogens will increase in occurrence or become more damaging in a warmer climate.
 8. **Increases in invasive plant species** – With increased disturbance, there will be more opportunities for the establishment of Invasive plants.
 9. **Changes in forest composition** – Many tree species will face increasing stress across the region, particularly those species that are not tolerant of drought and are at the southern edge of their range. Conditions affecting tree regeneration and recruitment will change.
 10. **Increased costs for forest operators** – Damage from storms, heavy rainfall, and regeneration failures from seedling mortality all add up to increased costs.

2. The risks were prioritized using the matrix below:

The effects of climate change will vary greatly, and some will have a more substantial impact on forest ecosystems and forestry operations. A risk management framework can help to identify the most significant climate change impacts and vulnerabilities and prioritize management responses. Considering these risks broadly across the Northwest region and across all SFI-certified organizations can provide a common understanding that individual organizations can use to refine based on their own circumstances. This regional risk assessment is designed to help focus (not limit) an individual organization’s climate change efforts.

Participants used the risk matrix below to identify the highest-priority issues from among all of the impacts that were identified.

Risk = the probability of an event multiplied by some measure of its consequence

1. What is the likelihood of the impact or vulnerability?

- Very likely**— it’s already beginning or has already happened.
- Likely**— it’s imminent that it will happen.
- Possible**— there’s evidence to support it happening but depends on other factors.
- Unlikely**— there’s evidence predominately supporting that it won’t happen.
- Very unlikely**— it would be against long odds to happen, but it’s still possible.

		Severity of Impacts				
		Negligible	Minor	Moderate	Major	Severe
Likelihood	Very Likely	Med. Low	Medium	Med. High	High	High
	Likely	Low	Med. Low	Medium	Med. High	High
	Possible	Low	Med. Low	Medium	Med. High	Med. High
	Unlikely	Low	Med. Low	Med. Low	Medium	Med. High
	Very Unlikely	Low	Low	Med. Low	Medium	Med. High

2. What is the severity of the impact if it does happen?

Consider forest ecosystem health as well as forestry operations.

- Negligible**— there is little visible, functional, or economic consequence.
- Minor**— there is some visible, functional, or economic consequence, but within the range of normal variability.
- Moderate**— visible, functional, or economic consequence is slightly outside the range of normal variability.
- Major**— visible, functional, or economic consequence is detrimental to operations and must be addressed for operations to continue.
- Severe**— visible, functional, or economic consequence that results in system failure.

Due to differences in climate caused by the Cascade Mountains, participants decided it would be best to separate climate change effects on the east side (drier climate) and west side (wetter climate) of the Cascade Mountains, as forestry risks, adaptation actions, and their prioritization differ. As a result, two sets of prioritized climate change risks were developed, and results are as follows:

West side scores				
Risk	Rating			Total
	High (3)	Medium High (2)	Medium (1)	
Extreme events	4	1	0	14
Increase in fire area burned	1	2	2	9
Warmer temperatures	1	1	3	8
Altered soil moisture and increased drought risk	0	2	3	7
Increases in insect pests and forest pathogens	0	2	3	7
Increases in invasive plant species	0	1	4	6
Milder winters	0	0	5	5
Changing precipitation	0	0	5	5
Changes in forest composition	0	0	5	5

East side scores				
Risk	Rating			Total
	High (3)	Medium High (2)	Medium (1)	
Increase in fire area burned	3	2	0	13
Extreme events	2	3	0	12
Altered soil moisture and increased drought risk	2	1	2	10
Increases in insect pests and forest pathogens	0	4	1	9
Increases in invasive plant species	0	4	1	9
Warmer temperatures	1	1	3	8
Milder winters	1	1	3	8
Changing precipitation	1	1	3	8
Changes in forest composition	0	3	2	8

The final portion of the workshop was focused on identifying adaptation strategies to address the top five risks. The adaptation ideas are separated into two categories of action for SICs (SIC) and SFI-certified organizations (CO). This yielded the following table (a further list of adaptation actions can be found at the [Climate Change Adaptation Library for the Western United States](#)).

Risk	Impacts to forests and forestry operations	(CO /SIC) - Adaptations (East (E) / West (W) when unique to area). Mitigation (risk reduction) when applicable.
Extreme events	<p>Increased road washouts and costs, potentially limiting access.</p> <hr/> <p>Temperature changes causing bud damage.</p>	<p>(CO) Increase culvert sizes when constructing roads or replacing culverts (CO) Install fuel breaks around high-value stands and infrastructure (CO) Design road systems to handle runoff and reduce erosion risk (CO) Increase monitoring (CO) Integrate flexibility in harvest plans for salvage (CO) Buffer unstable slopes (CO) Develop response plans for large disturbance events (e.g., wildfires) (CO) Incorporate emergency alternate route plans</p> <hr/> <p>(CO) Maintain or create stand diversity</p>
Increase in fire area burned	<p>Reduction in commercially viable timber. Economic loss on operations. Loss of productivity. Increased costs to operations.</p>	<p>(CO) Create adaptive plans for salvage logging operations. (CO-E) Increase use of prescribed fire to lower fire risk (CO-E) Conduct hazardous fuels reduction (CO) Increase installation of strategic fire breaks (CO) Develop and support alternative markets (i.e., biochar) (SIC) Increase fire readiness a. Implement logger training for initial attack and increase support for loggers on required RT130 training (Wildland fire and support training) b. Increase public education and outreach (CO/SIC) Control public access during periods of high fire risk to reduce accidental fire (SIC/CO) Increase public land road maintenance for fire control access (SIC/CO) Support management efforts (Good Neighbor Authority, fuel treatments, and others) for fire risk reduction on federal lands (CO) Support interagency cooperation on fire control (SIC/CO) Support increased use of technology in detection and rapid response. (SIC) Increase post-fire regeneration readiness (increase nursery capacity)</p>

Warmer temperatures	Potentially decreased growth rates. Increased drought stress. Species migration to higher elevation.	(CO) Plant alternative genotypes or species that better handle increased temperatures. (CO) Increase stand and genetic diversity (CO) Consider planting at lower densities to increase drought resilience (CO/SIC) Monitor and share best practices related to local effects of increased temperatures on species.
Altered soil moisture	Increased mortality. Reduction in growth rates. Reduced reforestation success.	(CO) Consider design of clearcuts to increase shaded areas. (smaller/patches) (CO-W) Retain slash where appropriate (CO-E) Create adaptive plans to alter timing of plantings to maximize survival. (CO-E) Increase use of drought tolerant species (CO) Increase thinning to reduce tree density, drought stress, and mortality. (CO) Increase site-specific herbicide deployment to increase vegetation control. (CO) Reduce competing brush (SIC/CO) – Monitor effects of soil moisture and share best practices. (CO) Create adaptive plans to alter timing of plantings to maximize survival. (CO) Target the timing of harvests to minimize disturbance (CO) Increase meadow restoration
Increases in insect pests and forest pathogens	Reduction in growth rates. Less productive forestland. Increase costs to operations. Increased mortality.	(CO) Increase monitoring to apply early detection and rapid response for pests and pathogens (CO) Create adaptive plans for salvage logging operations. (CO) Increase thinning to maintain stand vigor (CO) Consider planting alternate species that are more resistant to pests and pathogens (CO) Increase thinning to reduce density and increase vigor (CO-E) Prune when needed to prevent pathogens (CO) Implement harvest timing restrictions to slow spread of pathogens (CO) Implement Integrated Pest Management practices (IPM)
Changing forest composition	Reforestation challenges. Reduced growth of species on edge of range.	(CO) Implement silviculture alternatives <ul style="list-style-type: none"> a. maximizing species diversity b. directing movement of genetics to match climate c. maintaining pockets of advanced residual regeneration d. creating adaptive plans to plant alternative species. (CO) Direct movement of tree genetics for the site

		(CO/SIC) Support research and share best practices (CO) Strategically collect seeds and cones to match genetics to local climate (CO) Conduct landscape planning for sensitive sites, and by aspect, microclimates, elevation, etc. (CO/SIC) Develop logging strategies and training for protecting regeneration of a variety of ages and species
Invasive species	Reduction in growth rates. Less productive forestland. Increase costs to operations. Increased mortality	(CO) Implement early detection/rapid response (CO) Increase monitoring for invasives after fire and harvest (CO/SIC) Collaborate on best practices across landscapes/watersheds/cooperatives (CO) Consider aggressive treatment plans when infestation occurs (CO) Plan future operations for optimal times to reduce spread.
Changing precipitation	Increased road washouts and costs, potentially limiting access.	(CO) Implement best management practices to protect riparian areas, channel migration zones, and roads. (CO) Monitor for changes or newly developed springs (CO) Increase culvert size (CO) Adjust water diversions

Additional tools and resources for management considerations in climate smart forestry:

[Adaptation Library for the Western United States](#): Intended to inform sustainable management of natural resources, reduce the negative effects of climate change, and transition ecosystems to a warmer climate. It can also help integrate climate change in natural resource management, planning, and business operations.

[Management Actions for Northwest Forests](#): Can assist foresters, land managers, and landowners in adapting to and mitigating climate change in Northwest forests.

[Prescribed Fire in the Northwest](#): Describes advantages and disadvantages of prescribed fire in the Northwest and the process of conducting a prescribed fire.

[Climate Resilience Guide for Small Forest Landowners in Western Washington](#): Provides information, resources, and management actions to help small forest landowners adapt to a changing climate.

[Northwest Reforestation, Planting to Suit Current and Future Climates](#): Outlines guidelines and considerations when replanting Northwest forests so that trees are suited to current and future climates.

[Conservation Planning to Manage Alaska Yellow-Cedar](#): Discusses how climate change poses challenges to successful Alaska yellow-cedar management. A group of private and public entities is collaborating to integrate their research and data collection activities to address its decline and support an adaptive, multiple-use management model.

[The Seedlot Selection Tool](#): Assists land managers in considering climate change while planning reforestation and restoration efforts.

[Climate Risk Management Practices](#): Provides a synthesis of key climate change sensitivities and risk management practices for forest vegetation, non-forest vegetation, water and infrastructure, fisheries and fish habitat, wetlands and riparian areas, wildlife, and recreation for the Western US.

[Northwest Forests and Woodlands](#): Describes how climate change will affect forests and woodlands in the Northwest based on forest type.

[Climate Change and Wildfire in Idaho, Oregon, and Washington](#): Discusses the risk of large, frequent, and severe wildfires in Idaho, Oregon, and Washington. These fires are associated with warm and dry conditions that are likely to increase with climate change.

[Climate Toolbox](#): Shows observed and future projected climate information, including [future stream flows](#) in comparison to historical stream flows, for much of the Northwest.

[Forest Management Handbook for Small-Parcel Landowners \(Sierra Nevada and southern Cascade Ridge\)](#): Written specifically for small-parcel (10-100 acre) landowners in the Sierra Nevada and southern Cascade Region. It takes landowners through a step-by-step guide to creating a plan to cope with many of the changes brought by climate change.

[Assisted Population Migration for Forests of the Future in Washington](#): Describes the use of seeds adapted to current and future climates for assisted migration in Washington.

[Integrating Climate Change into Watershed Planning on the Gifford Pinchot National Forest](#): Describes how restoring functioning watersheds in Washington helps national forests adapt to changing snowpack and streamflow.

This report is intended to serve as a resource for climate smart forestry and does not constitute a complete list of adaptations. As further risks and adaptations are realized, this report may be updated accordingly.

Appendix 1

Northwest (US) SFI Implementation Committees

Regional Climate Smart Forestry Workshop

January 31, 2023, 9:00 am - 4:00 pm

PURPOSE & OBJECTIVES

The 2022 SFI Forest Management Standard includes a new Objective on “Climate Smart Forestry,” which sets expectations for SFI-certified organizations related to climate change risk assessment, adaptation, and carbon management. The Climate Smart Forestry Objective also introduces new opportunities for engagement and collaboration via the SFI Implementation Committees (SICs). This regional workshop is designed to help the SICs in the Northwest United States exchange ideas and provide some regional information for SFI-certified organizations, which they can use as a starting point in determining climate adaptation actions.

Specifically, this workshop will help the SICs to:

- Discuss potential climate change impacts to SFI-certified organizations and SFI-managed forests and prioritize climate change vulnerabilities
- Identify potential adaptation actions to address priority climate vulnerabilities
- Determine how SICs will share this information with SFI-certified organizations

Outcomes:

1. A ranked list of climate impacts and vulnerabilities for the Northwest US region
2. An initial list of adaptation actions for SFI-certified organizations to consider

WORKSHOP PRE-WORK

1. Review climate change impacts for Northwest forests.
 - a. Read [this article](#) on assessing vulnerabilities and adapting to climate change in the Northwest.
 - b. Review [this Storymap](#) on effects of changing fire regimes on forests in the Northwest.
 - c. Explore the [Climate Change Adaptation Library](#) to start thinking about adaptation options (filter by “Region 6: Pacific Northwest” and “Forest Veg” for adaptation options related to vegetation management).
2. Respond to [this short survey](#) no later than **Wednesday, January 25th** to share your concerns and questions.
3. Review the [Climate Smart Forestry Objective](#) in the 2022 SFI Forest Management Standard.
4. Review the SIC [Climate Smart Forestry Playbook](#) (see right side under “Documents”)

FACILITATORS

Dr. Jessica Halofsky, *Director, Northwest Climate Hub, U.S. Forest Service, Pacific Northwest Research Station*

Dr. Holly Prendeville, *Coordinator, Northwest Climate Hub, U.S. Forest Service, Pacific Northwest Research Station*

Dr. Thomas Timberlake, *Climate Change and Science Coordinator, Western Wildland Environmental Threat Assessment Center, U.S. Forest Service, Pacific Northwest Research Station*

Gordy Mouw, *Director, Network Relations, Sustainable Forestry Initiative Inc.*

WORKSHOP AGENDA

Location: World Forestry Center, Cheatham Hall, 4033 SW Canyon Rd, Portland, Oregon

Note: All times approximate. Agenda will be adjusted to accommodate discussion.

9:00 **Introductions and Indigenous Land Acknowledgement**

9:20 **Climate Impacts and Vulnerabilities**

Goal: Create a shared understanding of the climate change impacts that are of concern for SFI-certified organizations and SFI-managed forests.

- Presentation: Climate impacts and vulnerabilities for the Northwest (Jessica Halofsky)
- Group discussion: How might these impacts affect organizations in your state?

10:30 **Break**

10:45 **Risk Assessment – Breakout Groups**

Goal: To understand which climate impacts create the most concerning risks to SFI-certified organizations in the region. Risks may be related to the health and condition of certified forests, or to the forestry operations of SFI-certified organizations. We will use a risk assessment process to evaluate how individual risks may broadly affect SFI-certified organizations in the region, and then prioritize them.

11:30 **Risk Assessment – Discussion**

12:00 **Lunch (provided)**

12:45 **Complete Risk Assessment and Review Priority Risks**

1:15 **Climate Change Adaptation Concepts**

Goal: Introduce management options to help adapt forest management to changing conditions.

- Presentation: Climate adaptation in forest management in the Pacific Northwest (Holly Prendeville)

1:45 **Identify and Evaluate Adaptation Actions – Breakout Groups**

Goal: to brainstorm a list of actions that SFI-certified organizations can take to address the highest-priority climate risks. This list will be a starting point for individual organizations to consider.

2:30 **Break**

2:45 **Identify and Evaluate Adaptation Actions – Large Group Discussion**

- Groups report out

3:30 **Summary and Next Steps**

4:00 **Adjourn!**

Appendix 2 Attendee List

Name	Organization	SIC / State
Morgan Sandera	AFM	Oregon, Washington
Chris Eades	AFM	Oregon, Washington
Rick Hanson	Boise Cascade	Washington
Doug Meekins	Campbell Global	California, Oregon, Washington
Jay Powell	Fruit Growers Supply	Oregon, Washington
Tom Shorey	Fruit Growers Supply	Oregon, Washington
Mark Vroman	Hampton Lumber	Oregon, Washington
Lilly Brod	Manulife	Oregon
Chad McElvany	Molpus Woodlands Group	Idaho, Washington
Chad Washington	Nuveen	Oregon
Seth Barnes	Oregon Forest Industries Council	Oregon
Eric J Cohen	Port Blackely	Oregon, Washington
Devon Powell	Port Blakely	Washington
Ben Cazell	Rayonier	Oregon, Washington
David Springe	Rayonier	Oregon, Washington
Hayley Morris	Roseburg Forest Products	California, Oregon
Carter Manning	Sierra Pacific Industries	Washington
Tim Shiel	Stimson Lumber Company	Oregon
Glynis Gordon	Washington DNR	Washington
Nicole Jacobsen	WA SIC	Washington
Eric Sucre	Weyerhaeuser	Oregon, Washington
Michelle Metcalf	Weyerhaeuser	Oregon, Washington
Cristy Fiander	Yakama Forest Products	Washington
Talya Scott	Yakama Forest Products	Washington
Tia Beavert	Yakama Nation Tribal Forestry	Washington
Toni Sandoval	Yakama Nation Tribal Forestry	Washington
Jessica Halofsky	USDA Forest Service, PNW Research Station, Northwest Climate Hub	Facilitator
Holly Prendeville	USDA Forest Service, PNW Research Station, Northwest Climate Hub	Facilitator
Thomas Timberlake	USDA Forest Service, PNW Research Station, Western Wildland Environmental Threat Assessment Center	Facilitator
Nadine Block	SFI	Staff
Gordy Mouw	SFI	Staff