Forests and Climate Change

Presentation Guide

This document explains the flow and content of the "Forests and Climate Change" PowerPoint presentation. This presentation can be tailored to your audience and available time. We recommend you incorporate local examples where ever possible to really connect these issues to your particular community.

In this document you will find a screenshot of each slide in the PowerPoint, followed by two sections (where appropriate):

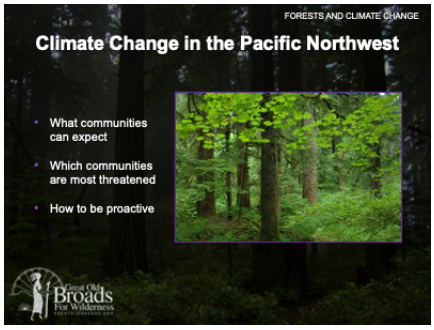
- Example language – outlines the concepts you want to communicate to your audience.
- Background information – helps provide a deeper look at the content.

Not all of this information may be needed in your presentation, however it will help guide the discussion for each slide and serve as a resource for you to further elaborate on a concept or cite sources. **Please make the presentation your own and share with us whatever content you find most effective.**

Don't have the time or venue for a PowerPoint? Consider this guide as a treasure trove of communication tools that you can incorporate into discussions, activities, or more informal outreach opportunities!

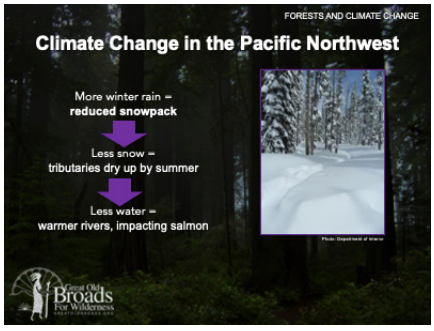
1

Example Language: Thank you. I'd like to explore with you the connections between forests and climate change here in the Northwest. <*share a bit about yourself, your passion for public lands and forests—but be sure to keep your intro brief*> To begin, I'd like to share a brief video with you about Broads and some of the basics of climate change. <*begin video*>



2

Example Language: Now that we have the fundamental science of climate change and see how public land use is contributing to it, what does all this mean to the ecosystems and our own communities in the region—especially those communities that are most at risk? What impacts are we seeing now and what can we expect in the future?



3

Example Language: In the Pacific Northwest, **warmer winters** will lead to a shift from **snowfall to rain** in the mountains. This is projected to **boost *winter* river flow**, but without the lingering snowpack to gradually melt over the course of the spring and summer will **reduce *summer* river flow**, causing tributaries to dry up. This makes typically cold rivers warmer—creating major problems for **endangered salmon** when they return to spawn in late summer and fall.

In addition, there's expected to be **greater year-to-year variability**. This means more years of very low rainfall and extended drought. But this also means **extreme weather events**—such as heavy, flooding rainfall—happening more often.

4

Example Language: Climate change in the Pacific Northwest generally means hotter and drier summer conditions that escalate the risk of dangerous and damaging **wildfires** to communities during extreme weather. Forests that are stressed by drought are also more susceptible to insect outbreaks and diseases that are becoming more aggressive due to climate change. The mountain pine beetle now develops faster and infects far more trees due to warming winters. Beetle outbreaks are moving to even higher elevations to places where beetles have not been recorded before.

Background: https://www.fs.usda.gov/ccrc/topics/bark-beetles-and-climate-change-united-states.

5

Example Language: Climate change is also impacting communities across the Northwest right now. The effects of climate change are not felt equally across communities. **Frontline communities** are experiencing the first—and often the worst—effects of climate change.

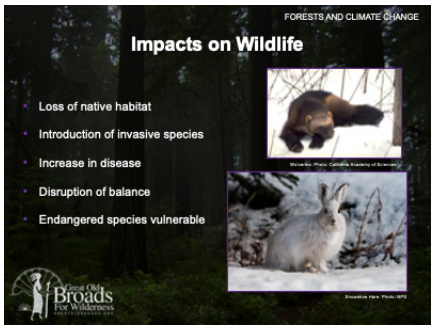
Frontline communities in the Northwest include:

- Tribes and Indigenous peoples
- Those most dependent on natural resources for their livelihoods
- The economically disadvantaged, among others

Tribes and Indigenous communities often rely heavily on the natural environment in ways that are critical to **cultural survival**. Climate change is projected to impact "**First Foods**" or historically cultivated subsistence, economic, or ceremonial foods such as berries, roots, fish, and local wildlife. These communities often have fewer economic resources to prepare for and cope with climate disruptions.

Background: *The cultural practice of harvesting and consuming First Foods is integral to tribes and Indigenous health. Many tribes, such as the Confederated Tribes of the Umatilla Indian Reservation are using climate change vulnerability assessments and climate change adaptation plans. This report (https://bit.ly/2RY7y8c) offers examples of local community organizations that are empowering front line communities while ensuring that people most affected by environmental injustices have a strong voice.*

Sources: *https://tribalclimate.uoregon.edu/*



6

Example Language: How wildlife responds to climate change can be complex—temperature shifts, changes in water availability, extreme weather events, and layered impacts from existing threats like habitat fragmentation can all impact wildlife. This is especially true for a **vulnerable endangered species**, or species that are dependent on a **winter snowpack** for their survival, like **wolverines** and **snowshoe hares**.

Background: *The lack of winter snowpack will be a problem for species like snowshoe hares—which have adapted to camouflage themselves with white coats in winter—as well as species that depend on snowshoe hares to survive, like the wolverine.*

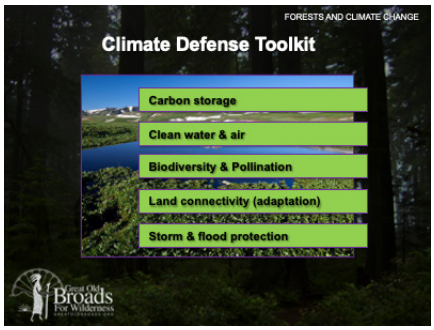
As climate change worsens, we can anticipate the spread of 450 tree-damaging pests introduced from around the world. This threatens to slow tree growth and increase tree mortality. A recent examination of non-native forest pests—insects, pathogens, and organisms that eat tree sap—threaten 40 percent of the nation's forests.

Sources:

- https://www.opb.org/news/article/snowshoe-hares-climate-change-northwest-survival/

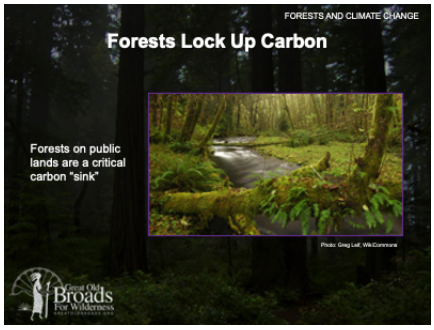
7

Example Language: Climate change is altering Northwest landscapes and impacting our communities in substantial ways. As these impacts intensify, they threaten to destabilize entire ecosystems and our communities that are connected to these landscapes. But what is the role of public lands—especially forests on public lands—as a climate change *defense*? How can landscapes contribute to the fight against climate change?



8

Example Language: Public lands—especially forests—have a natural, but largely unnoticed, toolkit to combat climate change. This includes the ability to pull and store massive amounts of carbon from the atmosphere. But forests also help provide clean water and air, biodiversity, vital pollinators, land connectivity to help wildlife adapt to a changing climate, and storm and flood protection for downstream communities.

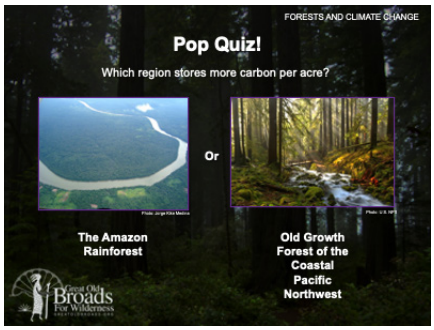


9

Example Language: The first tool forests offer is that they store massive amounts of carbon, keeping it out of the atmosphere and slowing climate change. It's estimated that forests worldwide remove **nearly a quarter** of the carbon dioxide humans pump into the atmosphere, substantially slowing the effects of climate change.

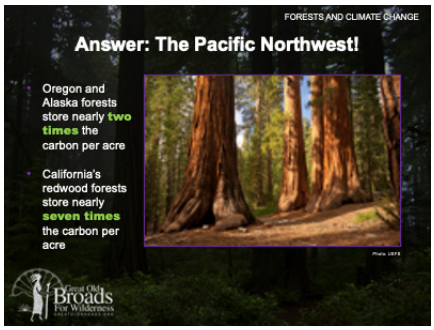
Forests on public lands store around **3 trillion tons of carbon**, keeping it locked away in the trees and soil. That's more carbon than is stored in US fossil fuel reserves. This makes undisturbed old-growth forests on public lands "**carbon sinks**." In simpler terms—carbon goes into the forest, but very little of it ever comes back out… as long as the forest remains undisturbed.

But forests have gradually accumulated all this carbon over **centuries**. Forests cannot currently keep pace with our emissions.



10

Example Language: Pop quiz time! Which region stores more carbon **per acre**—the **Amazon** or the **Pacific Northwest**?



11

Example Language: The Pacific Northwest wins! The Amazon tropical rainforest is one of the world's largest carbon sinks **by area**. But on a **per-acre basis**, the Amazon is not nearly as efficient at absorbing carbon as the coastal rainforests of the Pacific Northwest. In fact, the Douglas fir forests of Oregon and the hemlock and cedar forests of Alaska store about ***twice as much carbon per acre*** as the Amazon!

But the real grand prize goes to the giant coastal redwood forests of Northern California, which store ***seven times as much carbon*** as the Amazon in each acre of forest. They're regarded as the most carbon dense forests in the world.

12

Example Language: When we talk about forests, age is important. The thinking used to be that a tree became "**less useful**" over time…sort of like, say, the wholly innaccurate thinking about an "**old broad**." But now we understand that a tree's growth actually **accelerates over time**. A tree in a Pacific Northwest coastal forest remains viable for centuries—often for over **800 years**! It's actually not too surprising. Just take a look at the crosscut of a tree. All those tree rings growing out and out? It takes a lot of carbon to keep wrapping bigger and bigger rings of wood around a very old tree every year. **Never underestimate Great Old Broads**!

Background: *A study compiled growth measurements of 673,046 trees belonging to 403 tree species from tropical, subtropical and temperate regions across six continents. They found that the growth rate for most species "increased continuously" as they aged.*

Source: https://blogs.ei.columbia.edu/2011/12/27/arboreally-speaking-the-good-old-growth-curve-is-a-delusion/

13

Example Language: Wildlife thrives in old-growth forests, as the forests provide **more space and more diverse habitats** for native species to adapt, allowing them to be more resilient to a changing climate. Undisturbed old-growth forests are critical **refuge** from the **fragmented** habitats affected by human activities. What do we mean by "fragmented"? When an area of old-growth forest is developed, it's **not** just clear-cutting that impacts the ecosystem. **Roads, vehicle traffic, utility lines, pipelines, and any kind of development** can also create a fragmented habitat. Fragmentation not only makes the habitat become smaller, but also makes travel between now-divided habitat more dangerous. When ecosystems are fractured into smaller patches of habitat, the **edges** of these areas are no longer habitable to many species, including native birds that depend upon the **interior** forest habitat.

Background: *Climate change has caused decreased range in nearly half of studied animals and plants in North America. Ecosystems that are relatively intact have a better chance of maintaining biodiversity because they are not under as much stress as ecosystems fragmented by human development. Many of our public lands, which have been fragmented by industrial uses, are less resilient and adaptable to a changing climate. Enhancing landscape connectivity is critical to conserving biodiversity in a changing climate.*

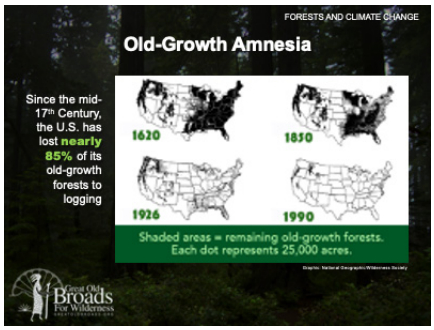
Source: https://www.iaspreparationonline.com/habitat-fragmentation/

14

Example Language: One of the most important (and **irreplaceable**) direct benefits old-growth forests offer to communities across the Northwest is fresh water. National forests are vital sources of drinking water for **more than 180 million people** in the United States. Undisturbed forests naturally cool and filter drinking water, recharge underground aquifers, and replenish surface waters like streams and rivers.

These sources of clean water are likely to become even more important to the region's population as summers continue to **get warmer and generally drier**, and other sources of water become **stretched to their limits**.

Source: https://www.fs.fed.us/water/



15

Example Language: When it comes to nature, we tend to have a remarkably short memory. But when you look at this illustration, you can see just how many old-growth forests have been lost to logging since Europeans began arriving in North America *en masse* in the mid 17th Century.

Nearly **85% of America's original old-growth forests—with trees that were many centuries old—are no longer intact native forests.**

16

Example Language: We know that undisturbed, old forests can lock up incredible amounts of carbon, keeping it out of the atmosphere and helping to slow the onset of climate change.

But what about **industrially-managed forests**?

The average lifespan of an industrially-managed tree is just **40 years**. This is not enough time to reach its full carbon capacity (remember, a tree in an old coastal rainforest can live more than **800 years**). In addition, tree farms tend to be **monoculture**—that is, just one species.

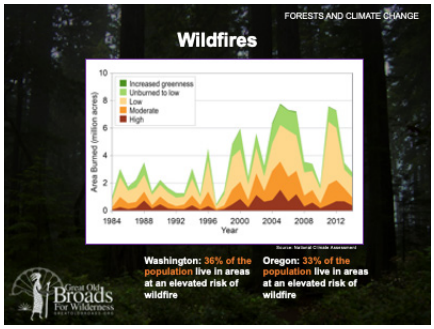
This **lack of diversity** not only lowers the overall carbon capacity of the forest, but also eliminates the many other benefits offered by old-growth forests that I'll explain next. **Maintaining intact forests** that have already built up massive carbon stores offers the most **immediate** climate benefits that surpass short-lived tree plantations.

Background: *Oregon Example—As recently clear-cut land grows, so too does the proportion of land that is emitting rather than sinking carbon dioxide.* ***Between 2001 and 2014 Oregon experienced a net loss of 1.2 million acres of forest cover.*** *There is no guarantee that these forests will recover fully and any guarantee is transferred to future generations to monitor their recovery.*

"Even though these are some of the most productive and carbon dense forests in the world, the carbon accumulated in much of the removed biomass took up to 800 years to accumulate—and cannot be recovered if current management practices continue."

17

Example Language: Our forests hold critical value in a changing climate, but are not at their full potential as a natural climate change solution. What might be holding them back? There are two **primary** forces that we might think of as direct impact on forests—wildfires and logging. Let's look first at wildfires.



18

Example Language: Thanks to the dramatic images of flames, billowing gray clouds that can blanket entire states with thick, lung-clogging smoke, and blackened landscapes—wildfires are probably the most **immediately recognizable impact** on a forest. And because of the increasingly warmer and drier climate, forests in the U.S. are more prone to wildfires than in past decades. In addition, the size and frequency of these fires are also on the rise, **especially in the West** where an increasing number of people live in or on the margins of forested areas.

For example, here in the Northwest, some **33% of Oregon residents** live in areas that are at an elevated risk of wildfires. In Washington, that number rises to **36%.**

Background*: This graph from 4th National Climate Assessment shows the area burned by large wildfires (greater than 1,000 acres and greater than 500 acres in the eastern United States) for 1984–2014. Although the area with moderate-to-high burn severity has increased in recent decades,* ***it has not changed as a proportion of the total area burned*** *(note: severity does vary across regions).*

19

Example Language: But in even the most severe wildfires only about **5-10%** of the carbon held in the forests is released. So as spectacular and potentially dangerous as wildfires are for humans, they really aren't an overwhelming source of greenhouse emissions.

Background: *Forests hold on to the vast majority of their stored carbon even after severe wildfires,* ***but only as long as the burned forests are not logged.***

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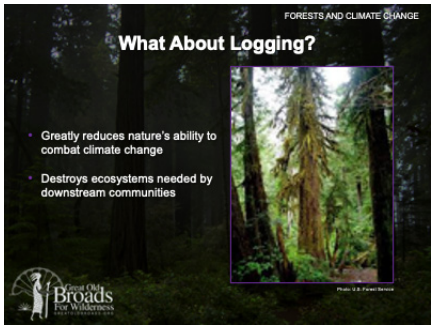
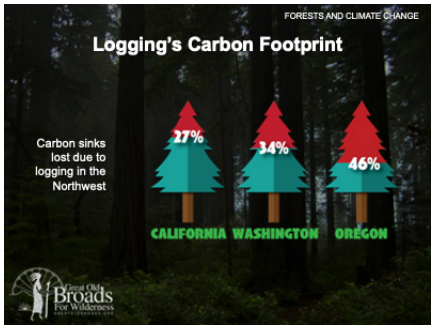
Example Language: In fact, naturally occurring wildfires are a **vital part** of maintaining healthy fire-adapted forest ecosystems. Nearly every forest in the United States—especially in the West—**has burned** and will burn again. But because of a century of government policy to suppress **virtually every wildfire**, many fire-adapted forests have been deprived of the fires they need to thrive, rejuvenate, and refresh themselves. Many animal and plant species have evolved to thrive with fire. Some tree species like the Lodgepole pine, **actually need fire** to stimulate the release of new seeds.



21

Example Language: Logging may not seem as **immediately** dramatic as wildfire, but it's climate impacts can be far more consequential. First, the removal of old trees obviously reduces carbon stored in forests. Second, logging forests takes away the other ecosystem benefits that we discussed earlier for downstream communities, such as clean water, flood and landslide protection, and the economic opportunities many small communities rely on across the region (especially tourism).



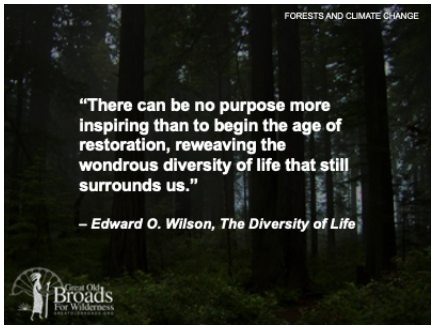
22

Example Language: Logging and logging-related emissions have **reduced the natural carbon sink in California by 27%, in Washington by 34%, and in Oregon by very nearly half**.

In fact, in just over 100 years, Oregon has removed the equivalent of all live trees in the state's Coast Range forests. Most of the carbon those trees held now resides in either **the atmosphere or in landfills**.

Background: *Study from 2001 to 2016 looked at the entire process in Washington, Oregon, and California. Found that the logging of forests in* ***Oregon emitted 33 million tons of CO2 – almost as much as the world's dirtiest coal plant.***

This scientific study calculated the "regional forest carbon balance (from 2001 to 2016) using observations from over 24,000 forest inventory plots in Washington, Oregon, and California (states with GHG (greenhouse gas) reduction mandates)." Source: Hudiburg, Tara W., et al. "Meeting GHG reduction targets requires accounting for all forest sector emissions." Environmental Research Letters 14.9 (2019): 095005



23

Example Language: "There can be no purpose more inspiring than to begin the age of restoration, reweaving the wondrous diversity of life that still surrounds us." – Edward O. Wilson, The Diversity of Life **(discuss quote)**

Cleary, there is some work to be done to optimize our public land's role in combatting climate change. So, how can the public make a difference when it comes to forests on public lands? There are all kinds of options!

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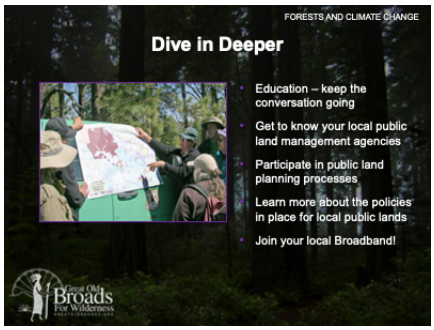
Example Language: The most direct way to become involved is through public lands stewardship events, like those offered through **your local Broadband**. Stewardship means going out into disturbed or endangered landscapes to replant native vegetation, remove invasive species, or test the land, air, and water to check and record their status and health. This sort of restoration work is a good way to not only heal the landscape but to also make it more resilient to the impacts of climate change. **It's also a great way to make some new friends!**



25

Example Language: But there are other important ways to become involved as well.

The first is to become more educated about forests—especially the ones in your area—and how climate change is impacting them, and then collaborating and **sharing** that knowledge with others. One of our biggest challenges is that we rarely **talk** about climate impacts.

Second, get to **know the local, state, and federal agencies** that manage the public lands in the area. **Stay in contact with your elected officials** at all levels of government and make sure they're aware of the impacts facing old forests on public lands. Getting involved in these conversations can help lead to the decisions that keep forests standing.

Third: **Participate** in the public lands planning process. **Attend and take an active part** in meetings, and **volunteer** to serve on advisory boards and committees.

Fourth: Get to **know and understand the policies already in** place for local public lands. Ask if these policies go far enough to combat climate change and build climate resiliancy.

Fifth: Join your local **Broadband** and check our website for upcoming events.

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<Thank you—ask if there are any questions.>