Forests & Climate Change Talking Points

Climate Change is currently influencing the health of landscapes and communities th oughout the Northwest. Explore the impacts of climate change on forests and dive deeper into carbon sequestration and wildfi es.

CLIMATE IMPACTS ON FORESTS

WILDLIFE

- As temperatures increase and droughts become more frequent, many animals that depend upon forests will need to migrate or travel longer distances to find suitabl shelter, food, and water.
- As seasonal events such as spring blooms and snowmelt shift, some species are following seasonal cues and behaviors that are out of sync with their changing ecosystem.
- Snow-dependent wildlife and threatened or endangered species are particularly vulnerable to climate impacts, especially species that change fur color from brown in the summer to white in the winter (weasels, snowshoe hare, and jack rabbits). These genetic traits may be unable to keep pace with rapid seasonal shifts.
- Many species, including many iconic bird species that depend upon old-growth forests, are expected to decline due to climate change.

DISEASE AND INFESTATION

- Forests are getting drier across the American West.
- Less precipitation means that trees are becoming stressed by lower water availability.
- Trees under stress are more vulnerable to insects and diseases, such as the mountain pine beetle. Recent warming has allowed mountain pine beetles to erupt at elevations and latitudes where winters historically were cold enough to keep them in check.
- Temperature and moisture shifts are causing landscape-scale tree mortality that will impact forest ecosystems and neighboring communities long into the future.

DRIER LANDSCAPES AND LONGER FIRE SEASONS

- More hot, dry, and windy days make for ripe wildfi e conditions.
- In the Pacific Northwest, the size, duration, and number of wildfires are increasing. It is estimated climate change contributed to an additional 4.2 million acres of forest fi es during 1984–2015 (double the expected area).

- If greenhouse gas emissions continue to climb at a moderate rate, the average area burned each year in the Pacific Northwest is expected to mo e than triple by the 2040s, relative to 1916–2006.
- Climate-driven wildfi es pose a unique challenge to communities as there are now over 40-million homes in fi e-prone landscapes across the West.

DIVING DEEPER: CLIMATE CHANGE & FOREST CARBON

FORESTS: A NATURAL CARBON SINK

- Trees take nutrients from the soil, water, and sunlight, but get half of their mass out of thin air by capturing carbon dioxide, then storing this carbon in their leaves, needles, branches, trunks, and roots.
- When a tree dies and breaks down, this carbon sinks deeper into the soil and is locked away. In this way, old-growth forests act as a natural "carbon sink."

HOW MUCH CARBON?

- Forests currently remove around a quarter of the CO2 humans add to the atmosphere, slowing climate change.
- Per acre, Pacific Northwest coastal temperate rainfo ests are among the best carbon sinks on the planet. Per acre, they lock up more carbon than the Amazon.
- If left intact, the Northwest forests most resilient to climate change (meaning they have low vulnerability to drought and fi e) have the potential to lock up as much carbon as burying 72,148 tanker trucks of gasoline, or eliminating ~6 years of current regional fossil fuel emissions.

NEVER UNDERESTIMATE OLD BROADS!

- Researchers have found that a typical tree in a coastal temperate rainforest can be 800 years old or more. Trees are full of carbon-sucking vitality well into their 5th, 6th, or even 7th century.
- Over centuries, forests not only accumulate carbon in living trees, they also build up deep, carbon-rich soils.
- Young forests, despite growing quickly, cannot store nearly as much carbon as the trees and soils of old-growth forests.
- If old-growth forests are logged, their carbon will move back to the atmosphere.
- Maintaining intact carbon-rich forests is a high-priority climate mitigation strategy with stronger immediate climate impacts than planting new forests.
- More than 90% of the intact old-growth forests in the lower 48 states have been lost since the 1600s.

Great Old Broads For Wilderness

BEYOND CARBON…

- Old growth forests also sustain diverse species and downstream communities in the midst of climate impacts.
- Intact old-growth forests serve as wildlife corridors, supporting ecologically diverse communities of species and ensuring the ecosystem's resilience to stress.
- As summer temperatures increase, forests maintain cool, clean drinking water.
- Old-growth forests efficiently sto e and gradually release water, ensuring that communities downstream have access to water during increasingly dry summers.

PUBLIC LANDS, LOGGING, AND CLIMATE RESILIENCE

- Many forests on public lands, including old-growth forests, are vulnerable to logging.
- One million acres of old-growth forests in the U.S. are currently unprotected.
- Once logged, forests are often converted to simplified plantation fo ests with one or just a few tree species. This dramatically reduces carbon storage.
- Trees are clear cut on very short harvest intervals (40 years). This practice harvests trees well before they reach their full carbon-storage potential (up to 800 years).
- As the area of 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 due to logging—an area equivalent to 6 ½ Crater Lakes National Parks.

FLIPPING THE CARBON BALANCE

- Between 1990 and 2002, carbon emissions from timber harvest in Oregon averaged over **20 million metric tons**, then surpassed 23 million metric tons between 2000 and 2014.
- To understand the current carbon balance of logging, researchers studied the entire process, from harvest to transportation, manufacturing, wood products, and decay. The "cradle to grave" analysis found that by the time a tree becomes a finished woo product, the vast majority of a tree's carbon has been wasted and released into the atmosphere.
- Some tree waste is burned immediately as slash piles, some of it is sent to landfills to decompose. Ultimately, just 4% of the tree's carbon ends up in wood products that last more than 30 years.

- Logging practices have reduced natural carbon sinks by 27% in California, 34% in Washington state, and 46% in Oregon.
- Approaches to keeping carbon locked in forests have been suggested by researchers, such as lengthening the cycle of logging to allow young trees to grow older and store more carbon during their lifetime.

DIVING DEEPER: WILDFIRE & CLIMATE CHANGE

THE ROLE OF FIRE IN CULTURE

- Indigenous Peoples in the Northwest region have carried out traditional fi e practices for centuries.
- The Tulalip Tribes practice traditional burning procedures to manage the mountain huckleberry—a culturally important but declining resource—to help preserve cultural traditions and heritage.
- Many tribes face legal roadblocks to managing their lands through cultural burning practices due to government restrictions.

A RESTORATIVE FORCE

- Fire is part of a natural cycle that diversifies and einvigorates the landscape. If we observe closely, we can watch this rejuvenation taking place.
- Forests are surprisingly resilient, even to high-intensity burns. Throughout the West, wildfires burn the landscape in a mixed pattern of severity, leaving a pattern like a patchwork quilt containing areas of unburned forests that act as seed banks, and stands of dead trees (or snags) offering refuge for nesting animals.
- Burned forests are often logged after a fi e—eliminating this vital ecosystem and setting the stage for unnaturally intense wildfi es.
- Logging, both before and after wildfi es, has the biggest impact on water quantity, quality, wildlife habitat, and carbon sequestration.

SEEING THE CARBON THROUGH THE SMOKE

- Forests retain the vast majority of stored carbon, even after severe wildfi es (as long as the burned forests are not logged).
- Wildfi es only emit about 5–10% of the forest's carbon back into the atmosphere.
- While increasing wildfi es are caused by climate change, wildfi es do not drive climate change.
- As forests naturally rebound after a disturbance, they rebuild their carbon sink, negating carbon losses from wildfi e.

Great Old Broads For Wilderness

DIFFERENT FORESTS, DIFFERENT FIRES

- There are key ecological differences between the wet and dry forests of the Northwest that drive different wildfi es in each of these ecosystems.
- The "human footprint" of past management also influences fire on these landscapes.

WET WESTERN FORESTS	DRY EASTERN FORESTS
• The maritime climate leads to the growth of wet forests that are dense, productive, and long-lived. • Wildfi es are naturally occurring, large, and infrequent (200 to 600 years between fi es) including large patches (1,000's to 100,000+ acres) with high tree mortality. • Given the naturally long gap between fires, fire suppression in the last century has not had a large-scale effect on wildfi e risk.	• Defined by drie , hotter summers and low soil moisture. Typically less dense. • Historically, experienced frequent, low-severity fi es that eliminated undergrowth and younger trees while larger, fi e-tolerant trees survived. • Need fi e to stimulate plant growth, recycle soil nutrients, and create diverse habitat for fi e-adapted species. • 100 years of fi e suppression by humans has left some forests uncharacteristically dense.

MANAGEMENT CHOICES TAILORED TO THE ECOSYSTEM

- Prescribed fi e (or controlled burn) is the art and science of managing low-intensity burns during favorable conditions.
- Prescribed fi e on the landscape is tailored to that forest's characteristics and should only be used in appropriate forest types.
- Thinning is another approach to managing flammabilit , which must be carefully guided with wildlife habitat and forests' species diversity in mind.
- Naturally dense, wet coastal forests are not suited to large-scale thinning but can benefi from well-timed prescribed burning.
- Some dry eastern forests benefit f om controlled burns and targeted thinning in overgrown areas to reestablish natural fi e intervals and a diverse forest canopy structure.
- Active forest management that passes beyond restoration to industrial forestry often involves the removal of large trees, which negatively impacts forest health, degrades wildlife habitat, and results in significant carbon emissions

- Severe wildfi es emit less carbon than commercial thinning projects of the same size.
- Research has shown that forests with intensive logging burned with higher severity than intact forests on public lands.

POLICIES MATTER

- State and federal wildfi e management policies have major impacts on forest ecosystems. For example, Washington state's Department of Natural Resources is required to actively and aggressively suppress all fi es, leaving little flexibility to manage wildfire as a natural process.
- The public can influence the management policies that shape fo ests' climate resilience.

LEARN MORE

- Get to know your local land agencies.
- Continue to educate yourself and your neighbors on public lands policy.
- Explore the policies that are affecting public lands' natural climate defense.
- Get involved in the public planning processes that shape these policies.
- Join your local **Broadband** to continue exploring climate connections and finding you voice to engage with these issues!