August 2026

Bend's Climate Assessment

What's Coming – The Forces Shaping Bend

BEND MADE

A PLAN FOR TOMORROW, CRAFTED TODAY.

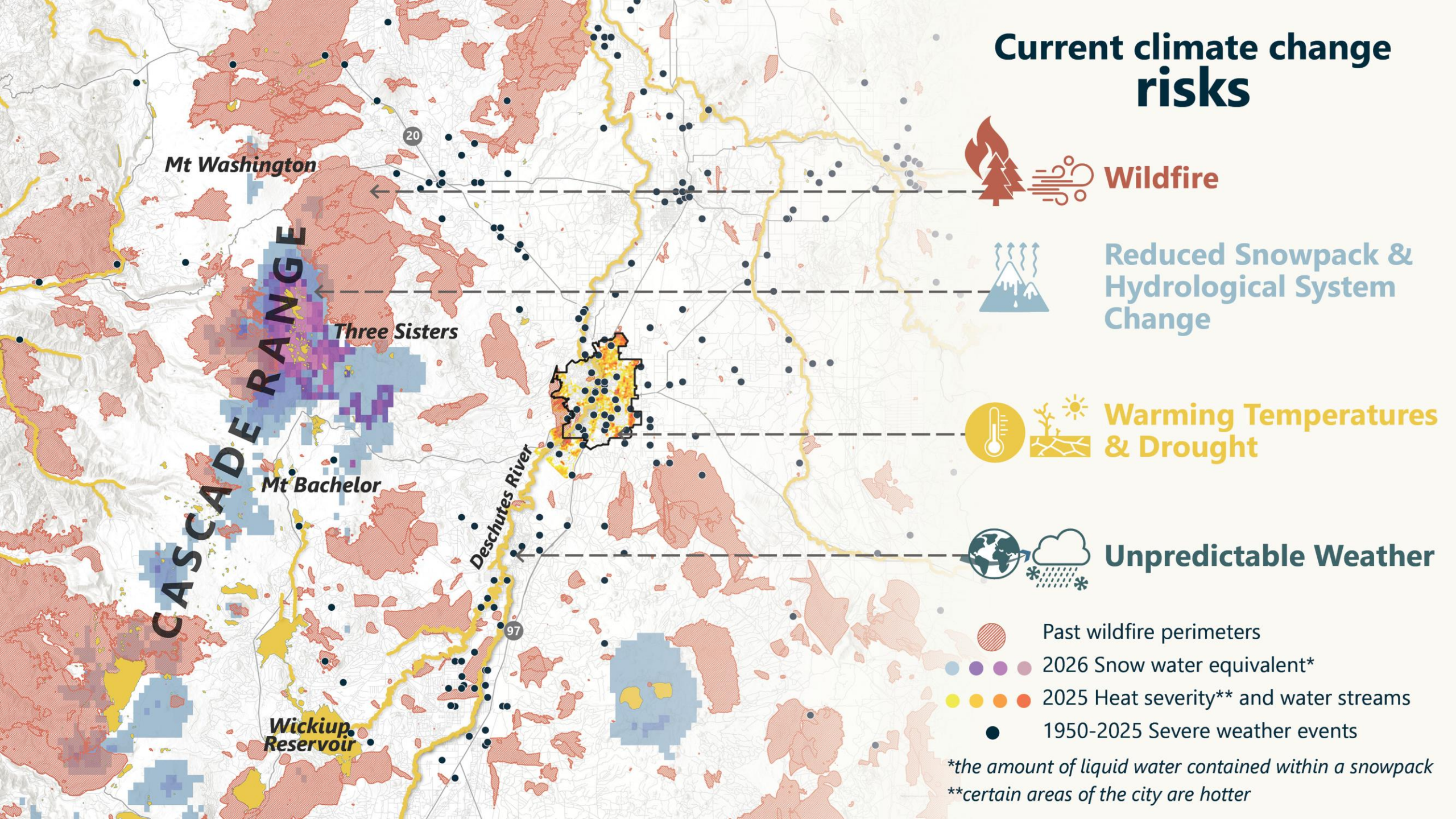
What's Coming – The Forces Shaping Bend

The goal of the Climate Assessment is to summarize current and anticipated climate change impacts to Bend and the region as part of the Drivers of Change assessment for Bend. Climate change is resulting in longer fire seasons, more smoke days, and pressure on water and is already resulting in raising costs for electricity and insurance costs in the region. Findings from this study are intended to inform City Council and community dialog on direction to the project team to consider climate resilient and sustainable growth as part of the Bend Made planning process.

As you review the content, consider the following questions:

- **Are we missing any forces?**
- **Which forces can the city actually influence?**
- **Which forces should the plan most directly respond to?**

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Current climate change risks
Wildfire
Reduced Snowpack & Hydrological System Change
Warming Temperatures & Drought
Unpredictable Weather
Past wildfire perimeters
2026 Snow water equivalent*
2025 Heat severity** and water streams
1950-2025 Severe weather events
*the amount of liquid water contained within a snowpack
**certain areas of the city are hotter
Mt Washington
Three Sisters
Mt Bachelor
CASCADE RANGE
Deschutes River
Wickiup Reservoir
20
97

Current climate change impacts

From 2016-2025, Bend had **~ 97 days of unhealthy AQI levels** due to wildfire smoke

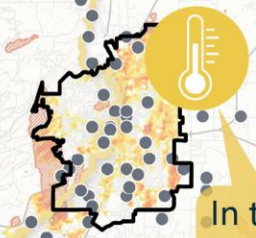


Wildfire smoke **disrupts migrating bird flights**

Atmospheric rivers cause about **80% of the state's flooding events**



With the exception of 2024, **Deschutes County has declared drought every year this decade**



In the last decade, Bend has scored **in top 20 US cities with highest urban heat island intensity**



Human health

Forest and city landscape health

Fish & wildlife habitat

Economy

Outdoor recreation

Identity

Tourism

Water systems

Infrastructure

Building materials and insurance prices

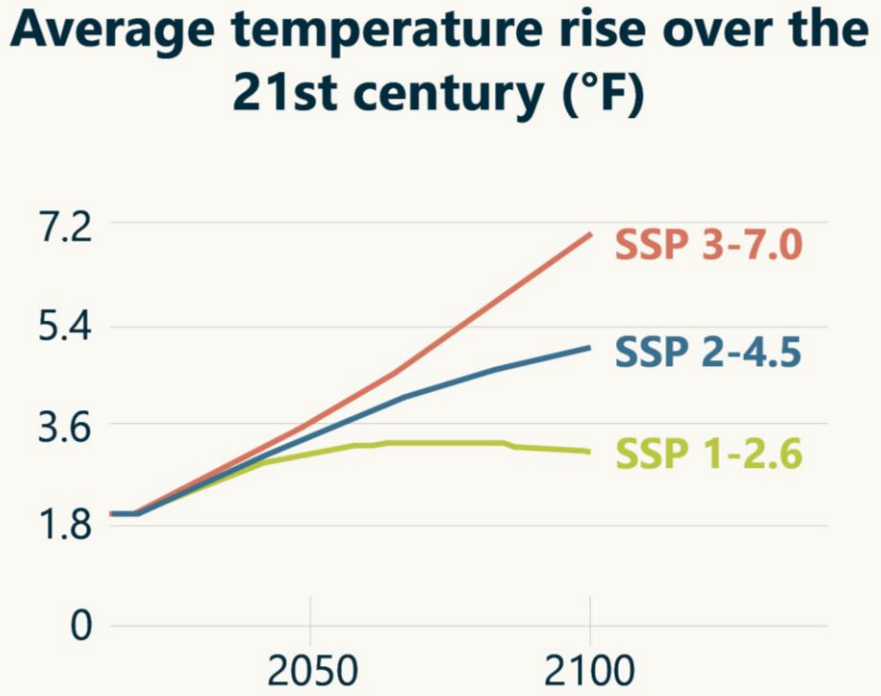
Since 1950, snowpack down 20%



Climate Change Scenarios

Shared Socioeconomic Pathways (SSPs) are "what-if" scenarios used by scientists to project how the world's population, economy, and technology might evolve over this century in response to climate change.

- **Upper Scenario SSP 3-7.0** *(The Rocky Road)*
- **Middle Scenario SSP 2-4.5** *(Middle of the Road)*
- **Lower Scenario SSP 1-2.6** *(Taking the Green Road)*



Climate Change Scenarios

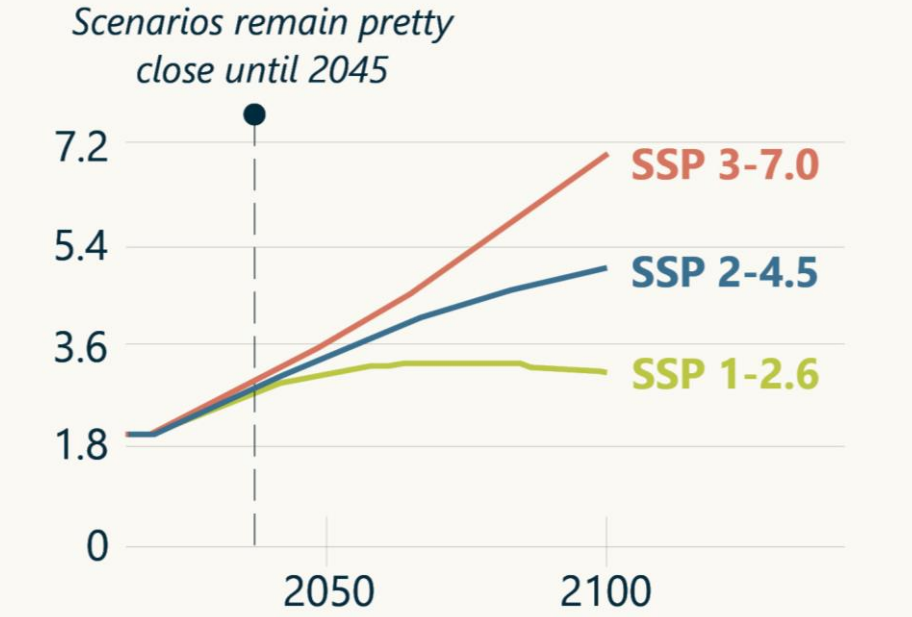
- **All scenarios have a similar impact on Bend until ~2050**
- **Climate change beyond 2050 is unpredictable**

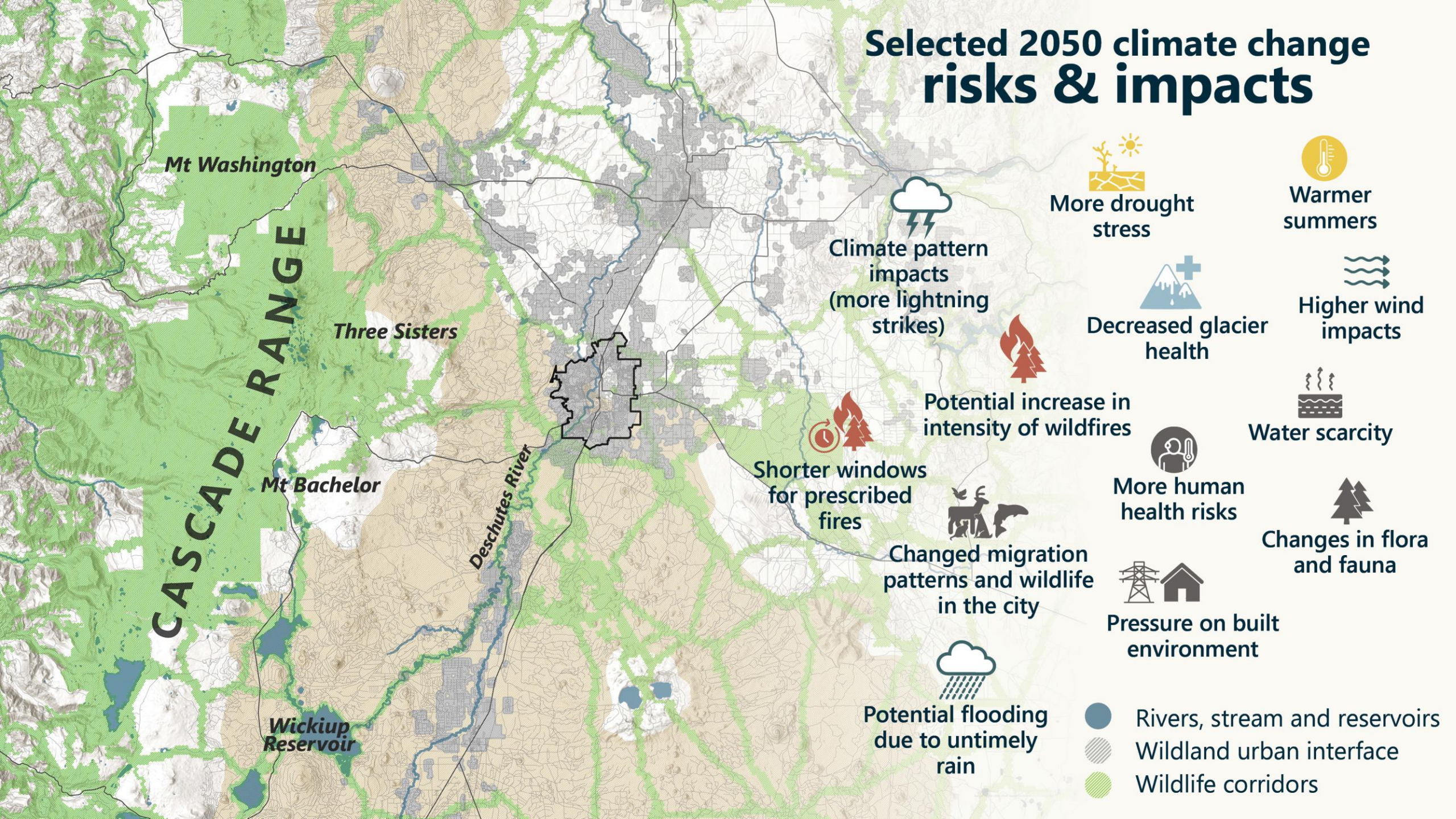
The commonly-referenced international goal:

*Limit global average temperature increases to no more than **2.7-3.6°F** (1.5-2°C) relative to temperatures at start of the Industrial Revolution.*

Average temperature rise over the 21st century (°F)

(Estimated rise until 2050 ranges from 2.7-3.6°F)




Selected 2050 climate change
risks & impacts
Mt Washington
CASCADE RANGE
Three Sisters
Mt Bachelor
Deschutes River
Wickiup Reservoir
Climate pattern impacts (more lightning strikes)
More drought stress
Warmer summers
Decreased glacier health
Higher wind impacts
Potential increase in intensity of wildfires
Water scarcity
Shorter windows for prescribed fires
More human health risks
Changes in flora and fauna
Changed migration patterns and wildlife in the city
Pressure on built environment
Potential flooding due to untimely rain
Rivers, stream and reservoirs
Wildland urban interface
Wildlife corridors

Key Takeaways

Wildfire:

- Fire season expected to increase along with wildfire smoke which is dangerous for human health
- Development in wildland urban interface is vulnerable to fire and subject to dramatic insurance repricing

Warming Temperatures and Drought:

- As Bend expands and average temps rise, need for more shade, cooling and health infrastructure
- Changes in snowpack and precipitation will impact city and basin water management practices, outdoor tourism, and agriculture.

Reduced Snowpack:

- Reduced snowpack could have major economic impacts

Unpredictable Weather:

- Strengthening infrastructure and built environment will help reduce impact of unpredictable storms

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Detailed Climate Risk and Impact Assessment

USDA Level III Ecoregions

Ecoregions are large, geographically distinct areas defined by shared environmental conditions, including climate, geology, soil types, and water features.

Bend sits where high desert, volcanic terrain, pine forest, and mountain ecosystems meet. The area transitions from dry sagebrush steppe in the Blue Mountains Ecoregion to dense conifer forests and alpine habitats in the Eastern Cascades Ecoregion.



Historically, Deschutes County's diverse ecosystems were **maintained by small fires**



Northern Rocky Mountain Ponderosa Pine Woodland and Savanna



Columbia Plateau Western Juniper Woodland and Savanna

Deschutes County Existing Vegetation



Inter-Mountain Basins Big Sagebrush Shrubland

Forest Health

Past forest practices, fire suppression and climate change have resulted in young, dense and more flammable mixed-species stands.



Western **US fire season has roughly doubled** since 1980

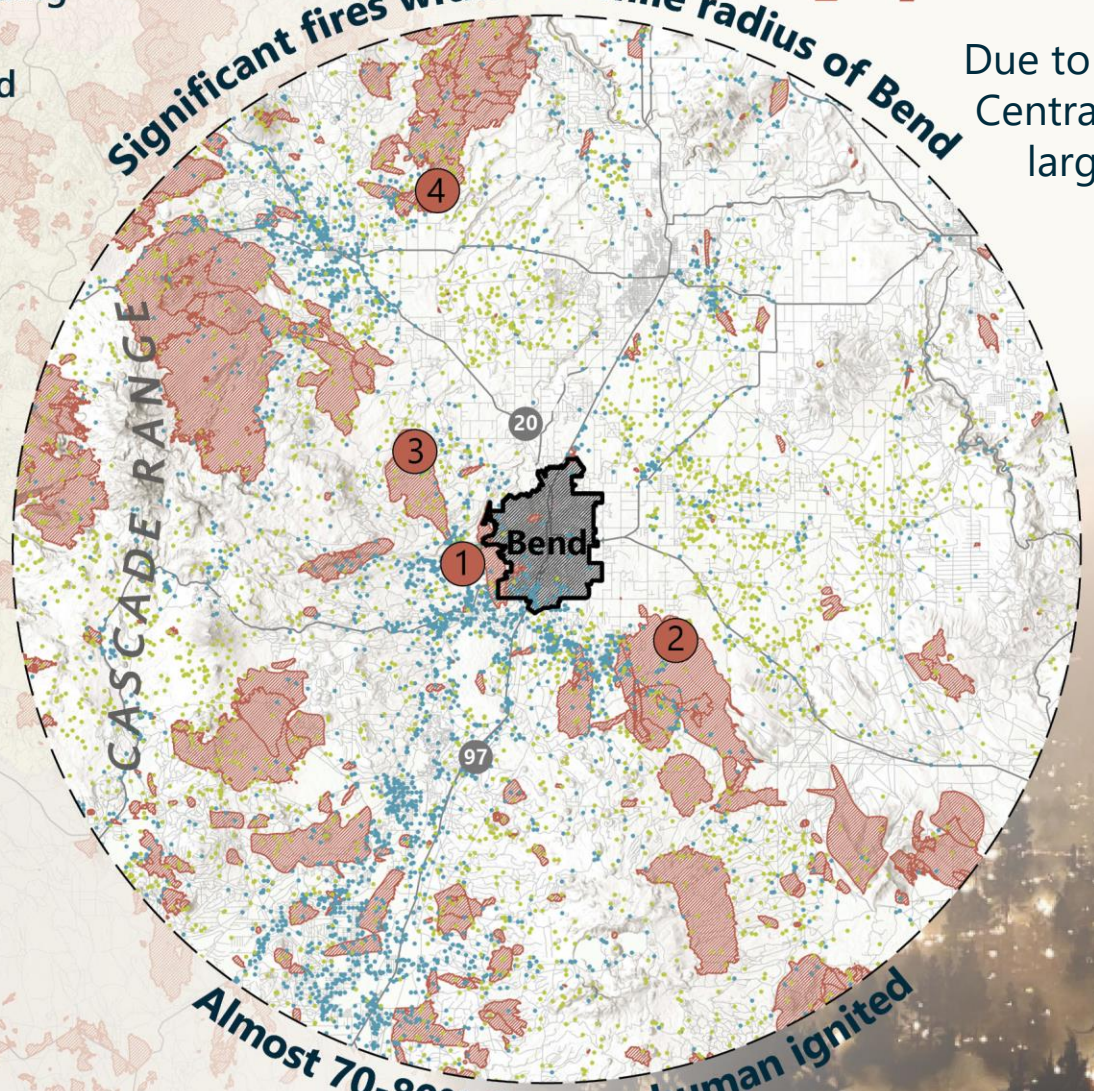
Due to fire suppression and climate change, Central Oregon has experienced a surge in large, hard-to-control fires, known as "megafires."

1 Awbrey Hall Fire
1990
- 3,500 acres burned
- $9 million in total damages, including suppression and insurance claims
- All 22 homes lost were in Wildland Urban Interface (WUI)

2 Skeleton Fire
1996
- Driven solely by wind
- Burned around 17,000 acres
- Forced evacuation of 450 homes and caused $2 million in damage

3 Two Bulls Fire
2014
- Burned around 6,900 acres
- 250 homes threatened

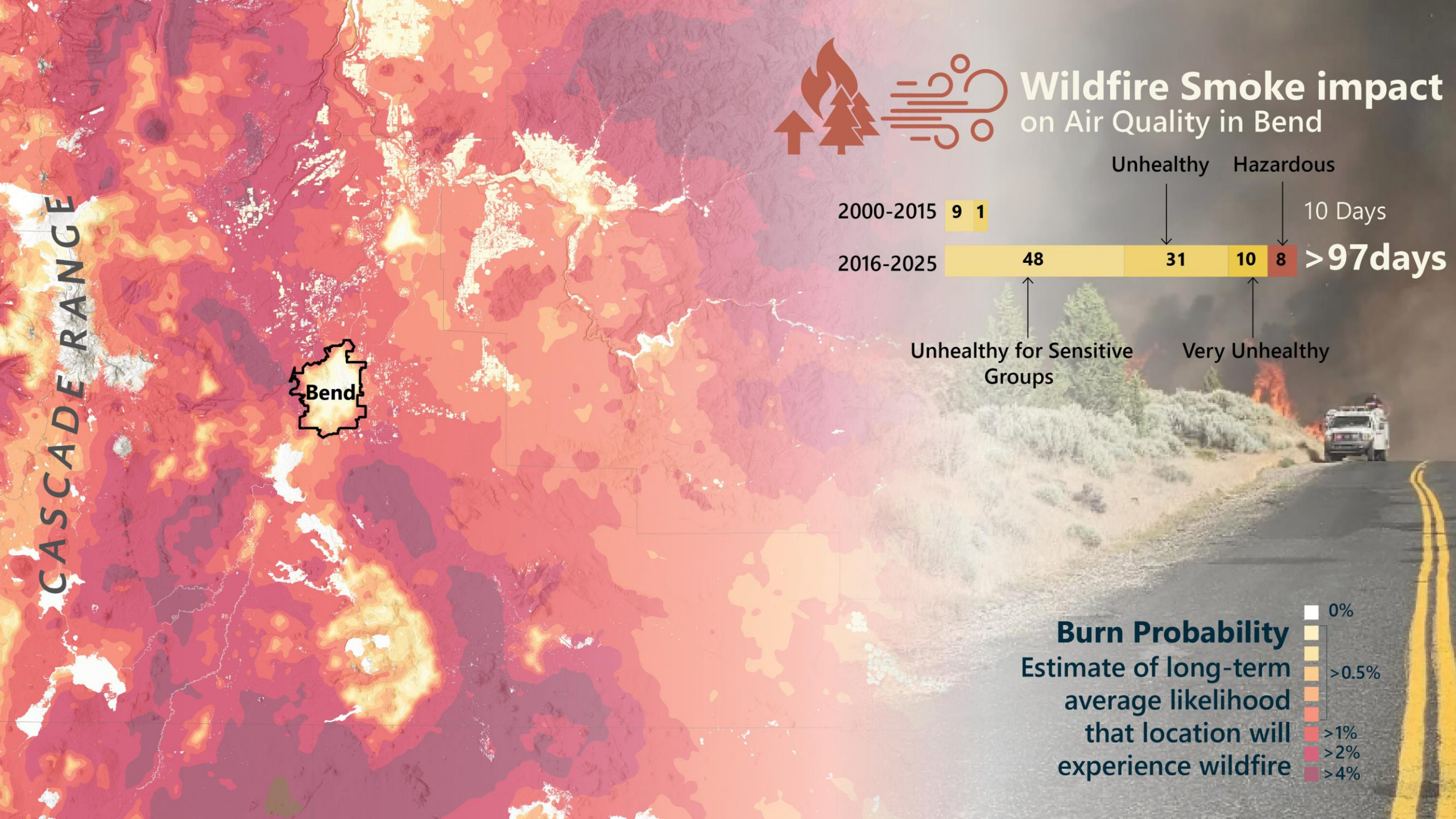
4 Flat Fire
2025
- Burned over 23,000 acres
- Hazardous air quality in Bend

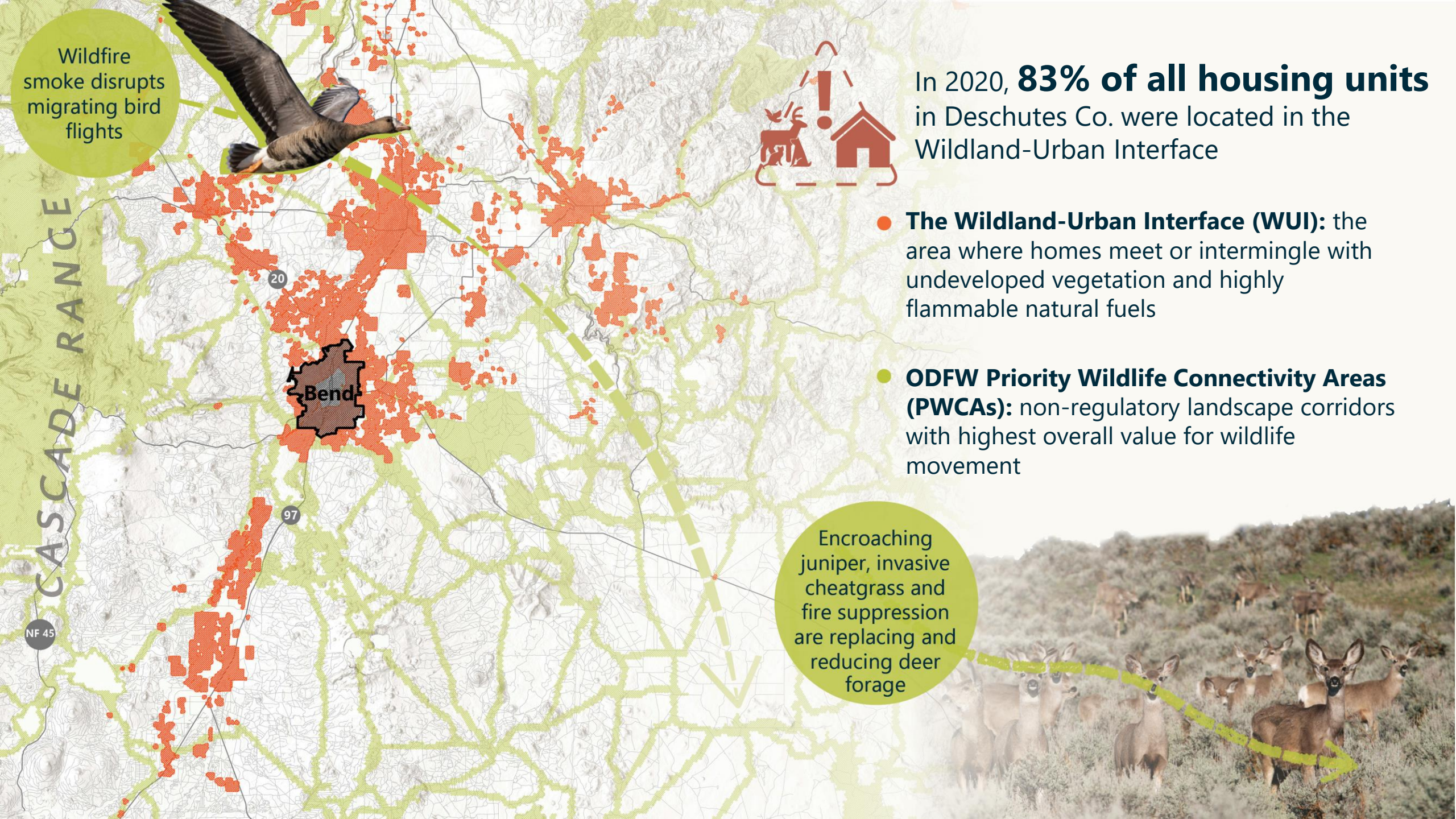


All Wildfire Perimeters up to 2025

Ignition Points (1992 -2024)
- Human ignited fires
- Natural ignition

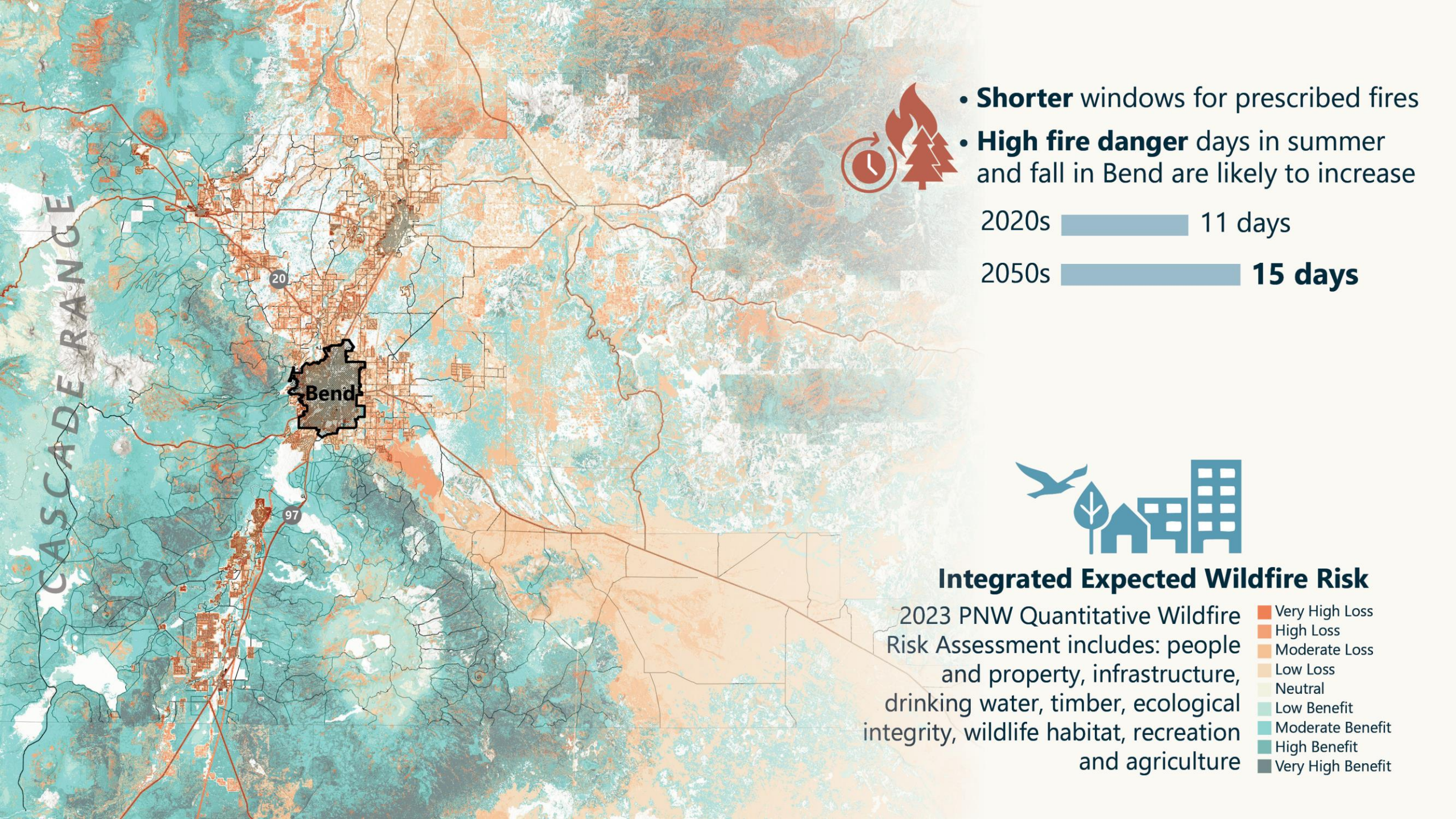



CASCADE RANGE
Bend
Wildfire Smoke impact
on Air Quality in Bend
Unhealthy
Hazardous
2000-2015
9
1
10 Days
2016-2025
48
31
10
8
>97days
Unhealthy for Sensitive Groups
Very Unhealthy
Burn Probability
Estimate of long-term average likelihood that location will experience wildfire
0%
>0.5%
>1%
>2%
>4%



In 2020, **83% of all housing units** in Deschutes Co. were located in the Wildland-Urban Interface

- **The Wildland-Urban Interface (WUI):** the area where homes meet or intermingle with undeveloped vegetation and highly flammable natural fuels
- **ODFW Priority Wildlife Connectivity Areas (PWCAs):** non-regulatory landscape corridors with highest overall value for wildlife movement



- **Shorter** windows for prescribed fires
- **High fire danger** days in summer and fall in Bend are likely to increase

2020s — 11 days

2050s — **15 days**

Integrated Expected Wildfire Risk

2023 PNW Quantitative Wildfire Risk Assessment includes: people and property, infrastructure, drinking water, timber, ecological integrity, wildlife habitat, recreation and agriculture

- Very High Loss
- High Loss
- Moderate Loss
- Low Loss
- Neutral
- Low Benefit
- Moderate Benefit
- High Benefit
- Very High Benefit

Local and regional impacts of wildfire

Damage to infrastructure



Contamination of resources



Loss of tourism and wildlife



Insurance repricing



Health risks



Since 1970, Bend's

average annual temperatures have warmed by

+2.4°F

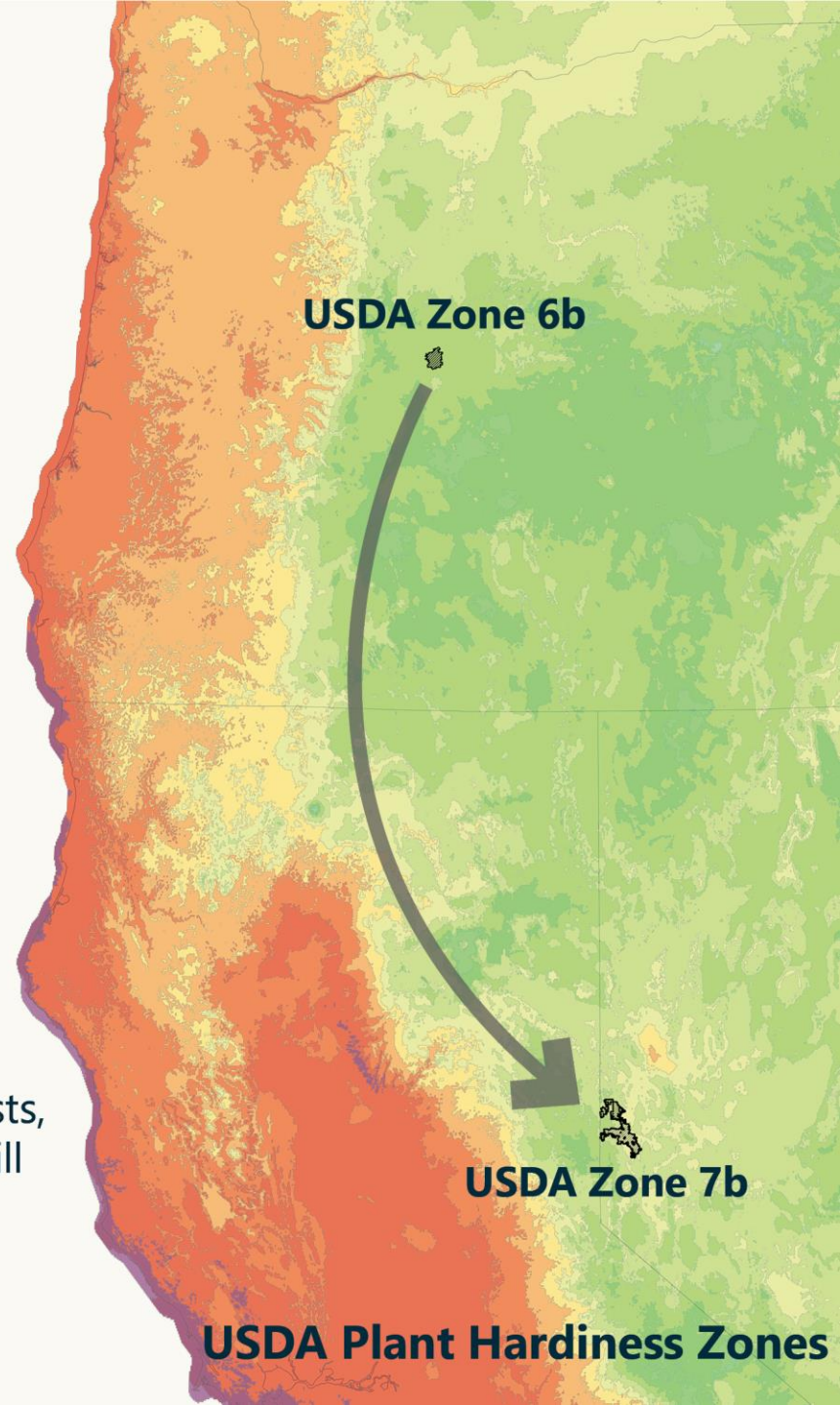


In the future, **Bend could feel more like Reno, Nevada does today**, in terms of temperature and precipitation patterns and

Extended dry, hot summers will lead to an increased number of days with high wildfire danger in Central Oregon.

Like Reno, Bend will rely less on mountain snowpack as winter precipitation shifts more toward rain.

Vegetation in forests, parks and farms will be impacted



Average days in Bend with max temp >90°F

2020s — 12 days

2050s — **26 days**



27% households are energy burdened

About 23% of Bend's residential buildings were constructed prior to the establishment of Oregon's energy conservation requirements.



Health risks

The 90°F mark is a critical tipping point for human health

- Cardiovascular disease
- Heat stroke
- Chronic respiratory illness
- Increased risks to elderly and infants

Cooling/Health infrastructure

Needed for:

- Vulnerable households
- Unhoused community
- Outdoor workers
- Overheated animals



With the exception of 2024,
Deschutes County has declared drought every year this decade



Higher temperatures lead to
higher rates of evaporation

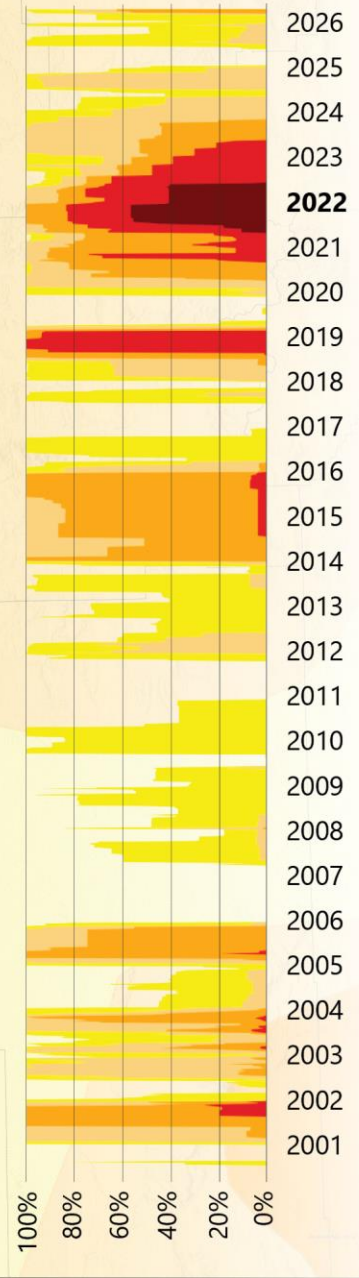
This leads to
- Low groundwater levels
- Low stream flows
- Water scarcity

Drought Intensity

This map shows drought conditions as of May 28 2026 (U.S. Drought Monitor)

- Abnormally Dry
- Moderate Drought
- Severe Drought
- Extreme Drought
- Exceptional Drought

Deschutes County Drought
2001-2026



In the last decade, Bend has scored in **top 20 US cities with highest urban heat island intensity**



Hard urban surfaces/heat islands, have nighttime temperatures about 2–5°F higher than shaded or vegetated areas

Heat Severity

This shows where certain areas of cities are hotter than the average temperature for that same city as a whole.

- 1 (slightly above the city mean)
- 2
- 3
- 4
- 5 (significantly above the city mean)

City wide average tree canopy

26%

For comparison,
Bellingham = 43%
Boulder = 14%



Tree canopy can lower temperatures by 4–8°F

Local and regional impacts of warming temperatures & drought

Water levels and Irrigation



Wildlife and Fish Habitats



Wildfire



Loss of tourism



Health-related problems



Snowpack is currently one of the largest contributors to streamflow in Deschutes River watershed

(Amount or thickness of snow accumulated on ground)



80in + **10in**

Approx. total precipitation in the watershed

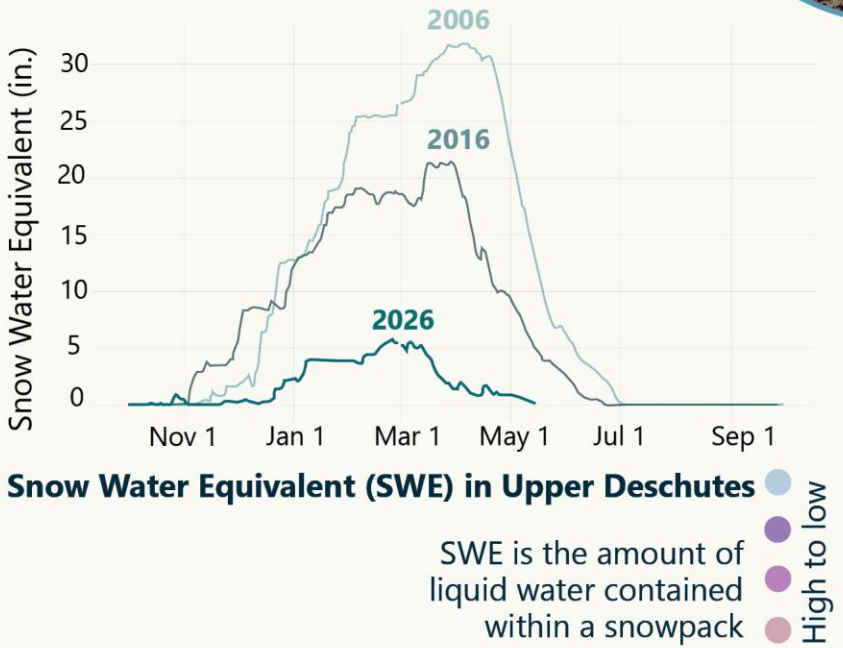
Forms snowpack on the Cascades

Snowmelt from the Cascades infiltrates into the ground and contributes to Deschutes River flows via springs and streams



Since 1950, snowpack down 20%





Snow Water Equivalent (SWE) in Upper Deschutes

SWE is the amount of liquid water contained within a snowpack

High to low

**Streamflows in the basin are not anticipated to see significant reductions due to reduced snowfall*

They are also impacted by changes in precipitation, practices of rural and urban users, irrigation districts

Mt Hood

Mt Jefferson

Three Sisters

Mt Bachelor

Diamond Peak

Deschutes Basin

While precipitation expected to increase, Oregon projected to **lose at least half of snowfall from 1950–2100**

Impacts on one of Bend's largest industries

Whitewater rafting



Winter recreation



Mountain biking



Glacier health



Tourism





Mt Bachelor is one of the **largest recreational employers** in Bend

Local and regional impacts of reduced snowpack

Warmer water



Seasonal low stream flows



Rural economies



Wildfire and drought



Agriculture



Local and regional impacts of unpredictable weather

Lightning strike wildfires



Power outages & flooded sewers



Property damage



Health-related problems



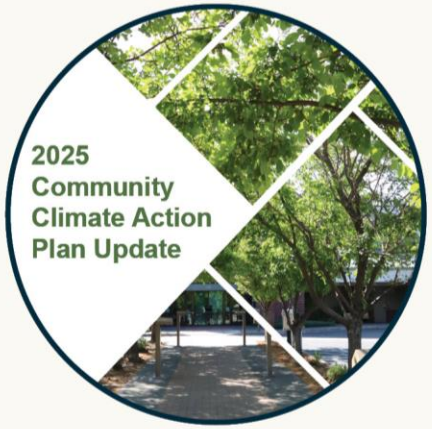
Road & underpass closures

**Flash floods at Franklin Ave*



Climate Resilient Growth

Current City and Community Initiatives



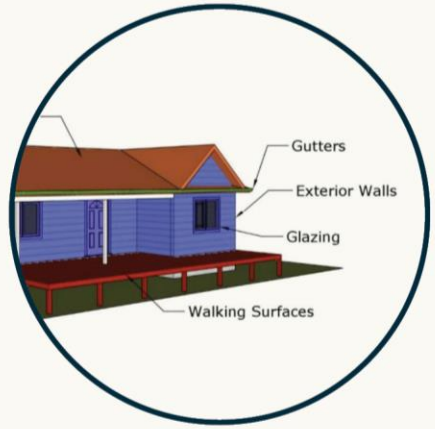
Community Climate Action Plan (CCAP)



Water Conservation Programs



Education programs such as Central Oregon Fire Prevention Cooperative and Own Your Zone defensible space program



Residential Wildfire Mitigation Building Code

Climate Resilient Growth

Potential Planning and Design Strategies



Defensible space & fuels reduction



Water resilience



Reduced energy costs



Integrated bike and transit



Tree canopy



Disaster preparedness & evacuation planning

Additional Strategies

Building code reforms

Additional risk related education

Infrastructure resilience

Tourism sector diversification

Robust public transport