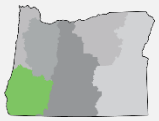

SOUTH COAST

REGION 2 Observed & Projected Changes for Habitats & Fish Species

Habitats

High-Elevation Forests & Parklands

credit: BLM

- Reduction in climatically suitable habitat for high-elevation forests.
- Increased conifer tree growth.
- Decreased meadow habitat as conifers establish and advance from the forest edge.
- Longer summer dry period and potential increase in area burned by high-severity fires.
- Increased competition between currently dominant species in the subalpine zone and those dominant at lower elevations.
- Lodgepole pine forests are likely to expand with increased fire frequency.

Moist Forests

Credit: Linda Repplinger

- Fire- and drought-intolerant species (e.g., western hemlock, Pacific silver fir, western redcedar) likely to decrease in abundance; species such as Douglas-fir and tanoak favored given projected changes.
- Hardwood species (e.g., tanoak) and shrub species (e.g., Ceanothus) may successfully compete with conifer seedlings in areas that experience multiple high-severity wildfires, particularly on drier sites.
- Increased productivity due to increased growing season length, adequate moisture levels, and increased atmospheric CO_2; however, moisture may become limiting for tree establishment and growth on drier sites.

Mesic Forests

Credit: Linda Repplinger

- Mesic forests in the region could transition to more xeric forests.
- White fir/grand fir abundance is likely to decline with drier conditions and increased fire frequency.
- Fire- and drought-tolerant species (e.g., Douglas-fir, incense cedar, sugar pine) likely to increase in abundance.
- Increases in temperature, drought, and extent of wildfire may increase the frequency of disturbance to fir forests by fir engraver.
- Increased area burned and drought severity will likely favor shrubs and larger patch size in mesic forests.
- Increasing summer drought stress will decrease growth for many species and increase vulnerability to insects and disease.

Ultramafic Forests & Woodlands

credit: Bill Bouton

- Increased drought stress may cause declines of some species that occur in serpentine soils however, past records indicate that reduced water may not affect plant communities on serpentine soils as much as those that occur on more productive soils.
- Endemic species confined to specific soils may be unable to migrate to suitable sites.
- Increased fire activity will likely favor shrubs over conifers on serpentine sites.

Dry Forests


credit: Jim Trodel

- Warmer temperatures, greater summer water deficit, and increased fire frequency could shift dry forests to woodlands or shrublands in the driest portions of the dry forest range.
- Large, high-severity fire patches may inhibit forest development and result in long-term shrub or hardwood dominance.
- More frequent fires will likely decrease tree density while the extent of shrub and hardwood patches will increase.
- Tree-canopy base heights will likely increase due to frequent fires removing lower branches.
- Occurrence and productivity of Douglas-fir may be limited by drought on drier sites.
- Potential increases in tree mortality due to interacting effects of drought, disturbance, & insects.

Woodlands


credit: Sue Sierralupe

- Projected expansion of woodland types with hotter and drier conditions.
- Increased fire frequency could reduce conifer encroachment, favoring the development of relatively open oak woodlands.
- Fire exclusion and nonnative annual grass species may limit the capacity of oak woodlands to adapt to changing conditions.

Shrublands


credit: Brewbooks

- Likely expansion with increased fire and summer water deficit.
- Chaparral shrub species likely to establish following high severity fire; repeated fire could perpetuate chaparral vegetation.

Wetlands, Riparian, & Groundwater-Dependent Ecosystems (GDE)


credit: Don Henise

- Reduced water during summer could potentially reduce the duration and depth of standing water and increase water temperatures.
- Drying in riparian areas may alter plant community composition.
- Increased precipitation variability and extreme precipitation events will increase the risk of damaging floods.
- Some ephemeral montane wetlands could disappear while some intermediate wetlands may become ephemeral.

Estuarine


credit: Frank Price

- Higher sea levels, stronger winter storms, and warmer, drier summer conditions will affect the spatial extent of estuarine habitats and interactions with coastal terrestrial habitats.
- Saltwater intrusion.
- Coastal flooding and erosion.
- Large mainstem rivers close to estuaries may experience greater tidal inundation and flooding in the winter in response to higher sea levels coupled with high flows from intense winter storms.
- Increased tidal inundation time on lowland marshes, altering vegetation composition and leading to a transition to mudflat or open water.

Fish Species

Steelhead Trout


credit: Greg Shields, cc

- Summer-run adult migration may be delayed by thermally stressful temperatures.
- Declines in summer flows that result in passage barriers may limit access to upstream spawning areas.
- Juveniles that rear in steep channels are vulnerable to more frequent or larger disturbances associated with wildfires and debris flows or floods and scour.
- Lower flows and warmer temperatures place additional stress on steelhead, which could increase pre-spawn mortality rates, impair spawning ability, or reduce viability of eggs and embryos.

Coastal Cutthroat Trout


credit: Bureau of Environmental Services.

- Migrating adults and juveniles located in low-elevation streams may be affected by increased water temperatures; headwater populations are likely less vulnerable because temperature increases are projected to be smaller.
- Potential increased susceptibility to wildfire, debris flows, and large summer flow reductions for populations using steep headwater habitats.
- Downstream displacement of headwater-rearing fish, with increased exposure to warmer stream temperatures and potential for intensified biological interactions with native and nonnative species found lower in the watershed.

Pacific Lamprey


credit: USFWS

- Temperatures exceeding 20°C (68°F) can cause thermal stress for rearing juveniles and migrating adults.
- Declines in summer flows may exacerbate fish passage issues as adult lamprey are relatively weak swimmers.
- Smallmouth bass become more active predators in warmer temperatures, which could increase the vulnerability of lamprey juveniles.
- Long residence time of immobile juveniles in stream substrates makes them vulnerable to increased peak flows and scour as well as wildfire-triggered debris flow that smother burrows.

Umpqua Chub


credit: Doug Markle OSU Fisheries

- May persist in cooler locations upstream of smallmouth bass invasion front, as predation by smallmouth bass has reduced or eliminated chub populations in much of the Umpqua River.

Coho Salmon


credit: USGS

- Warming water temperatures can accelerate egg incubation rates in winter or spring and potentially desynchronize the developmental phenology of juveniles from the temporal availability of seasonal habitats.
- Resident juvenile life stages are likely to be impacted by long-term summer flow declines and temperature increases, which can result in habitat loss, reduced population sizes due to increased competition for food and space, and mortality.
- Warming trends in summer may create chronic stresses for juveniles and could force upstream distribution shifts and range contractions.
- Increased channel disturbance (e.g., from larger peak flows, sediment deposition following fire) may affect coho during incubation and rearing life stages.

Chinook Salmon


Credit: Greg Morgan, BLM

- Spring Chinook migrating upriver during the warm summer months may be vulnerable to increasing stream temperatures (e.g., altered migration timing or stopping migrations temporarily; reduced viability of eggs or increased pre-spawn mortality rates in adults).
- The South Fork Umpqua River and mainstem Umpqua River currently have the warmest temperatures in the region; future projections suggest further warming which, when coupled with enhanced predation by smallmouth bass and increased potential for disease outbreaks, likely makes these populations more vulnerable.
- Summer temperatures are less of a concern during adult migrations elsewhere in the region.

Information from the following references and the citations therein:

1. Halofsky, J.E., D.L. Peterson, and R.A. Gravenmier, eds. 2022. Climate change vulnerability and adaptation in southwest Oregon. Gen. Tech. Rep. PNW-GTR-995. U.S. Dept of Ag., Forest Service, Pacific Northwest Research Station. 445 p.
2. Halofsky, J.E., D.L. Peterson, and R.A. Gravenmier, eds. 2023. Climate change vulnerability and adaptation in Coastal Oregon. Gen. Tech. Rep. PNW-GTR-XXX. U.S. Dept of Ag., Forest Service, Pacific Northwest Research Station. XXX p.