NATURAL CLIMATE SOLUTIONS WORKFORCE DEVELOPMENT AND TRAINING PROGRAMS NEEDS

Submitted to the
OREGON LEGISLATURE

by the
OREGON DEPARTMENT OF ENERGY and
OREGON CLIMATE ACTION COMMISSION

DRAFT FOR PUBLIC COMMENT
December 2025

ACKNOWLEDGEMENTS

[To be added in final report]

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EXECUTIVE SUMMARY

[To be added in final report]

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REPORT SUMMARY

In 2025, the Oregon Department of Energy commissioned this first-of-its-kind Natural Climate Solutions Workforce Development and Training Programs Needs Study (the Study). Natural climate solutions (NCS) enhance or protect carbon sequestration and storage, maintain or increase ecosystem function, and maintain or increase community wellness.[1] This Study, which responds to House Bill (HB) 3409 (2023), assesses Oregon's NCS workforce and related workforce development and training programs to identify gaps and opportunities for growing this workforce's ability to meet Oregon's climate goals.

This Study identifies specific training, skills, education, and resources that could help prepare the Oregon workforce to meet future demands for NCS implementation. The breadth of resources required to support the NCS workforce will require public-private partnership. As a result, this Study's recommendations are intended to serve as a roadmap for ongoing collaboration between decisionmakers; Tribal governments and, state, federal, and local agencies; workforce development training providers; non-governmental organizations (NGOs); contractors, philanthropic entities, and others.

Throughout the development of this Study, ODOE engaged three working groups at key intervals to collect feedback: 1) the Oregon Climate Action Commission (Commission), 2) the Natural and Working Lands Advisory Committee (N&WL – AC), and 3) the Interagency Working Group (IWG).[2] The project team, consisting of Estolano Advisors, Kimímela Consulting, and ECOnorthwest, engaged 29 key workforce partners and three Tribal Nations via one-on-one virtual interviews to inform the Study's findings and recommendations.

Key Takeaways

This Study evaluates the robustness of the NCS workforce and is informed by feedback from the working groups and partner engagement conducted throughout the project. Key takeaways from the Study's conclusions are:

1. ***There is high demand for restoration work in Oregon.*** Almost all interviewees indicated that there is no shortage of work to be done to mitigate and adapt Oregon's N&WL to climate change. There are nearly 130,000 NCS jobs in Oregon, and the need for these jobs will continue to grow as climate impacts intensify.
2. ***There are already successful youth training programs throughout the state.*** These programs hold significant promise to train a strong cohort of future workers in NCS. Youth are excited about careers in natural resource management, restoration, and conservation. Training youth is especially important given that a sizeable portion of the current NCS workforce is nearing retirement. In most NCS occupations, most workers are between the ages of 30-54, with some NCS occupations supporting large shares of workers over age 55. With greater resources, these youth training programs could expand their capacity to advance this critical work.

[1] ORS 468A.183

[2] Department of Agriculture, Department of Forestry, Department of Fish and Wildlife, Department of Land Conservation and Development, Parks and Recreation Department, Department of State Lands, and Watershed Enhancement Board.

3. ***NCS workforce demographics are shifting toward more gender and racial diversity.*** Industry leaders observed that effective workforce training, better access to education, and increased career awareness have driven diversity in the workforce, although the workforce assessment indicates that this trend is uneven across occupations. While Oregon's NCS workforce has a higher share of BIPOC workers than Oregon's workforce overall (NCS workforce is 26 percent Hispanic or Latino and 9 percent non-Hispanic BIPOC), the proportion of female workers in NCS is still behind the share of female workers in the state (NCS workforce is 22 percent female).
4. ***Rural areas of the state have a smaller pool of candidates for NCS project design, planning, and management roles due to the limited training and educational resources available in those regions.***[3] As a result, rural organizations and agencies have a difficult time recruiting and retaining qualified candidates for vital NCS positions, and there is an unmet demand for restoration workers in rural regions of Oregon. The limited scale of the local NCS workforce in these areas hinders many ready-to-go projects. Critically, some rural economies, like in the Eastern Oregon region, heavily rely on NCS occupations for their workforce (14 percent of Eastern Oregon's workforce is in NCS-related occupations). A boost in state investment and additional training opportunities would help contractors meet the NCS demand and increase hiring in these areas of the state.
5. ***The NCS workforce is vulnerable to external factors such as shifts in federal funding and immigration enforcement.*** Changing federal priorities are creating uncertainty among NCS employers, funders, and workers. The federal government has historically driven much of the funding for planning and implementing NCS on Oregon's N&WL. Further, many NCS jobs (e.g., forest planting crews and farm workers) have a largely immigrant labor force that is vulnerable to Federal immigration actions.

POLICY AND LEGISLATIVE RECOMMENDATIONS

The recommendations in this section are intended to serve as a roadmap for ongoing collaboration between Tribal, state, federal, and local agencies; workforce development training providers; non-governmental organizations; contractors, and philanthropic entities, among others. Some of these recommendations may require legislative action. Grounded in input from workforce partners and Tribal Nations, this section focuses on practical actions that support the growth of the NCS workforce. This report organizes recommendations into four areas: 1) Coordination, Contracting, and Procurement, 2) Recruitment and Hiring, 3) Training and Advancement, and 4) Metrics, Monitoring, and Accountability.

[3] This Study uses the term "region" to refer to a large geographic region within the state of Oregon, such as a group of counties.

Coordination, Contracting, and Procurement

These recommendations address how state agencies, and when appropriate, key collaborators, involved in carbon sequestration work and workforce development can take actions within their contracting and purchasing power to support quality NCS jobs.

1. **Create a statewide NCS workforce strategy:** A state-led workforce strategy could define competency standards, align training providers, and expand apprenticeship-like pathways for careers in the N&WL sector.
2. **Lead a regional, coordinated approach to NCS planning, implementation, and maintenance:** State agencies could establish a regional, planning framework, that aligns funding, permitting, and project timelines across watersheds, counties, and Tribal Nations.
3. **Align multiple NCS projects into year-round employment contracts:** State agencies that manage NCS contracts could bundle multiple NCS projects — for example, reforestation, riparian restoration, invasive species removal, habitat restoration, and the associated data processing work that occurs with monitoring progress — into larger procurements to support availability of full-time employment for NCS workers.
4. **Coordinate braided funding and multi-year grant-making strategies:** With a regional plan, the state could coordinate federal, state, and philanthropic dollars, often called braided funding, and provide multi-year grant commitments for workforce development. This approach would simplify access for grantees and enable long-term planning.
5. **Formalize Tribal co-governance and support Tribal-led NCS projects:** State agencies could co-create funding and planning processes with Tribal Nations, supporting Tribal sovereignty, Indigenous ecological knowledge, and cultural stewardship practices such as cultural burning.
6. **Increase contractor supply and capacity through expanded access to public contracts:** The state could provide targeted technical assistance, licensing and bonding support, and multi-year prequalification to stabilize contractor pipelines.
7. **Explore wider use of project labor agreements or community workforce agreements to implement labor standards on contracts above a certain size or scale:** Project labor agreements and community workforce agreements use collective bargaining to promote the public interest and have been successfully deployed in the construction sector. State agencies that contract out major NCS projects could use these tools to ensure the hiring of local workers and contractors.
8. **Review and revise evaluation criteria for contractor selection on NCS investments and projects:** State agencies could review and potentially revise their contractor selection criteria to award additional points to contractors that partner with indigenous experts and projects or build teams that can show knowledge and incorporation of indigenous traditional ecological and cultural knowledge (ITECK) into their project planning and implementation approach.
9. **Lower barriers to, and increase compensation for, NCS workers:** State agencies could encourage or require contractors to lower barriers to entry for NCS workers. Agencies could do so by: 1) encouraging employers to allow new employees up to 90 days to attain needed certifications, 2) discouraging the use of unpaid internships or volunteer labor as a means for private contractors to implement restoration activities, and 3) exploring requiring prevailing wage standards to ensure local participation and ensure wages compete with the local market and include employment benefits.

Recruitment and Hiring

These recommendations aim to support NCS job seekers at key junctures in their worker journeys when seeking employment and at the time of hire. These recommendations include activities that span the public, private, and nonprofit sectors.

10. **Explore leveraging Oregon's existing childcare and labor partnerships to expand childcare capacity and strengthen workforce development outcomes:** State agencies and the Department of Early Learning and Care (DELC), could leverage existing state efforts to meet NCS workforce needs in childcare by: 1) exploring the expansion of the Bureau of Labor and Industry's Apprenticeship Related Child Care Program to cover NCS jobs connected to training programs, 2) exploring the development of targeted child care infrastructure program grants, and 3) exploring a collaboration with Department of Early Learning and Care, Higher Education Commission (HECC), Business Oregon, Department of Human Services (DHS), other state agencies, and Tribal Nations to plan and co-invest in childcare solutions.
11. **Explore the development of a variety of housing solutions to serve the NCS workforce:** Tasks that could support housing development include: 1) coordinating across jurisdictions to develop a housing needs assessment for the NCS workforce, 2) expanding grant guidelines to include housing assistance, 3) leveraging state and federal programs to expand and improve housing for NCS workers, and 4) engaging Tribes, community-based organizations, and youth-serving organizations to ensure housing solutions reflect community priorities.
12. **Explore locating drivers' education and testing facilities in rural parts of the state:** The state could consider co-locating DMV satellite locations with workforce development centers, community colleges, libraries, post offices, and other public-serving institutions.
13. **Develop model hiring language that allows candidates to qualify for entry-level NCS jobs through equivalent experience rather than strict credential or degree requirements:** Hiring managers could review where requirements can be relaxed, and if equivalent to on-the-job experience, an associate's degree, Indigenous ways of knowing, and lived experience can be considered instead.
14. **Explore scaling the use of agreements between accredited conservation programs and full-time jobs in the public sector:** Public agencies could explore reciprocity agreements with accredited conservation programs throughout the state to help bridge the transition from training to full-time employment. Under a reciprocity agreement, graduates with relevant training from the accredited conservation program can apply to state positions with the equivalent of one-two years of on-the-job experience.

Training and Advancement

These recommendations aim to support NCS workers as they gather additional skills and advance within the industry. These recommendations include activities that span the public, private, and nonprofit sectors.

15. **Explore expanding and scaling existing NCS-related training programs and regional training opportunities through coordination and investments, especially for rural communities, youth, and Tribal Nations:** To advance this goal, the state could: 1) deploy a NCS workforce sector plan, 2) continue and increase support to youth-focused programs, 3) leverage upcoming Workforce Pell Grants,[4] and 4) direct investments to support the reentry population.

[4] https://www.jff.org/blog/budget-bill-expands-pell-eligibility-whats-next-for-students-and-providers/

16. **Develop NCS-related credentialing for workers and contractors to upskill the current workforce and improve wage and career prospects:** To support this, the state could: 1) explore the viability of an NCS-related maintenance credential, 2) support ongoing technical assistance to further implementation of NCS, and 3) partner with Tribal Nations and Tribal Colleges to explore the creation of an ITECK certification system.
17. **Explore creating a cross-agency, paid, public sector "NCS Fellows" program that gives early-career workers hands-on experience across multiple land types and agencies, including Tribes:** Under this model, "NCS Fellows" would rotate through state agency departments, Tribal Nations, Soil and Water Conservation Districts, building a broad skill set before transitioning into permanent roles in the public or private sector.

Metrics, Monitoring, and Accountability

These recommendations focus on tracking the growth of the NCS workforce over time. These recommendations include activities that span the public, private, and nonprofit sectors.

18. **Track NCS-specific data on industry composition and occupations:** State and federal agencies, industry organizations, and employers could conduct additional research to better understand the alignment between formal occupation descriptions and the occupations as practiced in the field. More engagement with self-employed firms and individual proprietors will be crucial to understanding the needs of this segment of the sectors.
19. **Agencies could track the number and type of jobs created through state-funded NCS investments, and report workforce outcomes publicly:** Administering agencies could collect information on jobs and training services that are supported by NCS-related investments. The state could also consider reporting on this data publicly through a dashboard.
20. **Track data on NCS training placements and retention:** Oregon could lead by requiring public-sector funded NCS programs to track retention rates at 6, 12, and/or 24-months post-training. An agency such as the HECC, which specializes in understanding and deploying workforce investments, could collect and analyze this data as part of a broader sector strategy.
21. **Assess future demand for NCS projects to more accurately anticipate near and mid-term workforce needs**: ODOE and partner agencies could seek funding for a demand study to gain a more accurate assessment of the number and types of occupations needed to plan, implement, and maintain NCS projects.

INTRODUCTION

Through the adoption of HB 3409 in 2023, the Oregon Legislature established a state policy to implement natural climate solutions (NCS) to help mitigate the future impacts of climate change. HB 3409 also called for a review of existing NCS workforce and training programs and additional needs that would help increase the pace and scale of NCS deployment across the state. Previously, Executive Order 20-04 resulted in a Natural and Working Lands Proposal that highlighted the need for increasing the pace and scale of NCS workforce development, training, and technical assistance. HB 3409 addressed that need and also established Oregon's Natural and Working Lands Fund to support investments in natural climate solutions implementation across Oregon.

In 2025 and in response to HB 3409, the Oregon Department of Energy (ODOE) commissioned a first-of-its-kind Natural Climate Solutions Workforce Development and Training Programs Needs Study (the Study). The Study describes and categorizes Oregon's NCS workforce and reports on existing and needed workforce development and training programs to deploy and scale NCS across the state.

This Study's findings demonstrate that investing in the NCS workforce is crucial for maximizing the benefits of natural climate solutions, which include climate change mitigation and adaptation, and additional benefits like biodiversity protection, resiliency and improved economic outcomes for workers. This Study offers policy recommendations that will support landowners, Tribes, agencies, NGOs, land managers, and environmental justice communities with engaging the workforce they need to support natural climate solutions and Oregon's climate goals.

Report Contents

This Study is organized into the following sections:[5]

- ***Study Approach*** which describes the approach to the Study, including complementary engagement and the Study's limitations.
- ***Evaluation of the Workforce*** which consists of a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of the NCS workforce and training landscape for N&WL.
- ***Overview of NCS Workforce*** which provides foundational quantified information on workforce characteristics that can guide workforce planning and future investment in NCS across N&WL sector in Oregon.
- ***NCS Workforce Needs Findings*** which describes challenges, needs, and gaps that may affect the ability of the NCS workforce to meet Oregon's future nature-based climate goals.
- ***Policy and Potential Legislative Recommendations*** which identifies the partnerships, policies, and investments needed to create a more robust NCS workforce.

[5] ODOE will provide Study addenda on labor organizations and Tribal Nations/inter-Tribal in January 2026.

STUDY APPROACH

Primary Research Question

What are the workforce development and training solutions needed to support the adoption of natural climate solutions on natural and working lands?

The Study primarily sought to answer the following research question: What are the workforce development and training solutions needed to support the adoption of NCS on natural and working lands? The project team defined workforce development and training solutions as specific training, skills, education, and resources that could help prepare the Oregon workforce to meet future demands for natural and working lands.

The Study also addressed four supplementary research questions through qualitative and quantitative analyses:

- What are the key NCS occupations in Oregon?
- What are some exemplary NCS workforce development and training programs in the state?
- What is the scale and composition of the NCS workforce?
- How robust is the NCS workforce? What challenges, needs, or gaps may affect its ability to meet Oregon's climate goals?

Further, the Study builds on findings from previous reports, many of which have been influential for the state. The consultant team reviewed the following reports to inform this Study's findings and recommendations:

- Jobs for the Future: Quality Jobs Framework
- National Oceanic and Atmospheric Administration: *Building Tomorrow's Climate-Ready Workforce*: *A Landscape Analysis* (2025)
- Oregon Climate Action Commission: Natural & Working Lands Fund Biennial Report (2024)
- Oregon Global Warming Commission: Natural & Working Lands Proposal (2021)
- Oregon Higher Education Coordinating Commission: Oregon Forest Operations and Management Workforce Study (2025)
- Oregon Housing and Community Services Department: Cultivating Home: A Study of Farmworker Housing in Hood River, Marion, Morrow, and Yamhill Counties in Oregon (2023)
- Oregon State University: Foundational Elements to Advance the Oregon Global Warming Commission's Natural and Working Lands Proposal

The Study does not address questions of how many workers are needed to deploy a certain number of NCS projects or meet a certain land-based target or carbon sequestration and storage goal. Once the state has such goals, either through the establishment of a nature-based carbon sequestration and storage goal approved by the Commission or via overall land-based targets put in place by EO 25-26, ODOE can address that question.

The Study employed the following definitions for two key terms cited throughout the analysis:

- **Natural Climate Solutions (NCS):** The Study relies on the state's definition of NCS, which is: "An activity that enhances or protects net biological carbon sequestration on natural and working lands, while maintaining or increasing ecosystem resilience and human well-being."[6]
- **Natural and Working Lands (N&WL):** The Study analyzed the workforce for the following land types:
    1. Cropland
    2. Grassland and Rangeland
    3. Wetland
    4. Forest and Shrubland
    5. Urban Greenspace Engagement

Figure 1: Types of Natural and Working Lands

Engagement

HB 3409 directed the Commission and ODOE to conduct extensive engagement during the development of the Study. This section describes the project team's approach to engagement.

Tribal Nations

Through HB 3409, the legislature directed OCAC to establish a process for consultation with Tribal Nations in this state to advise the OCAC on the performance of its natural climate solutions duties.

We are currently in a phase of discovery, uncovering past lessons learned by the Commission's efforts in working with Tribes, developing an understanding of Oregon Tribes' history and how that may inform this effort, identifying which Tribes are interested in engagement on this topic once funding is secured, and determining who our Tribal government staff contacts may be. Additionally, for this Study, Kimímela Consulting conducted dialogues with Tribal organizations and Tribal governments to illuminate nature-based workforce challenges for Indigenous people and Tribal Nations. Kimímela Consulting's findings are a solid beginning and are informing the Commission's and ODOE's NCS work across the board as well as this Study's findings and recommendations. In addition, an Addendum to this Study will be submitted to the legislature in January with key recommendations from these conversations. ODOE and the Commission have been conducting outreach to gauge Tribal Nation interest and needed support

[6] ORS 468A.183

throughout 2025 and will continue crafting an in-depth process to work together as ODOE hears from Tribes.

Starting in September 2024, Director Benner and Commission Chair Macdonald sent a formal letter to the Chairs of the nine federally recognized Tribes to provide an update on NCS work and to extend an offer to participate in the process to advise ODOE and the Commission on NCS workstream deliverables, including a Land-based Net Carbon Inventory, a NCS Workforce and Training Program Needs Study, and the adoption of NCS Goals and Metrics to increase net carbon sequestration and storage on the state's natural and working lands over time. ODOE staff were able to talk to the Coquille Tribe in response to the letter. In response to their feedback — as well as receiving guidance from the Affiliated Tribes of Northwest Indians as they work to coalesce publicly available knowledge on climate resilience plans for each Tribe in Oregon — ODOE staff plan to review all available Tribal climate resilience documents and deepen engagement with Tribes in 2026.

While the work to establish the Inventory occurred rapidly, Inventory improvements and natural climate solutions are ongoing. The Commission and ODOE have created a separate parallel process based on a longer timeframe to meaningfully engage with Tribal Nations. The approach aims to create meaningful interactions and co-develop next steps and a process useful to the Tribes to advise the Commission on NCS work, including this Inventory. In fall 2024, the Commission received a Draft Engagement Strategy,[7] presented by Against the Current Consulting. This strategy is guiding the approach that ODOE and the Commission are taking to work with the Tribes. ODOE and the Commission have been conducting outreach to gauge Tribal Nation interest and needed support throughout 2025 and will continue crafting an in-depth process to work together as we hear from Tribes.

Natural & Working Lands Advisory Committee

ODOE convened a Natural & Working Lands Advisory Committee to advise the Commission, with specific positions required by statute representing natural and working lands experiences and knowledge bases. Table 1 lists the positions required by statute. ODOE has worked to fill the Tribal seat referenced below but has not successfully identified someone for this role. This has been a consistent theme across similar bodies, where the legislation includes a requirement for Tribal membership, but Tribal Nations or inter-Tribal organizations do not have sufficient capacity, particularly for voluntary positions occurring during the work day without compensation. The approach ODOE and the Commission are using for engagement with Tribal Nations in Oregon aims to be respectful of their sovereign status and time and is described above.

[7] Affiliated Tribes of Northwest Indians Resolution #24-15, "Supporting Tribal Engagement and Climate Action in Oregon: Endorsement of the Oregon Climate Action Commission's Tribal Engagement Strategy in Alignment with Oregon House Bill 3409 Priorities."

Table 1. Natural & Working Lands Advisory Committee positions listed in ORS 468A.197

Number of Members*	Position(s) Description	Names and Affiliations
1	Tribal culture, customs, and government	Vacant
1	Local government representative whose primary economic activity is derived from agriculture, forestry, fishing and hunting	Ellen Hammond, Jefferson County, Soil and Water Conservation District
1	Urban forestry or parks management	Jonathon Soll, Metro
3	Forestry or forest products, including one private forest landowner with less than 5,000 acres of forestland	Ben Hayes, Hyla Woods and Springboard Forestry Betsy Earls, Weyerhaeuser Jason Callahan, Green Diamond
2	Agriculture, including one who owns a small family farming operation	Mike McCarthy, McCarthy Family Farm LLC Jocelyn Bridson, Tillamook Creamery
1	Livestock experience	Aubri Spear, Eocene Environmental Group
1	Blue carbon experience	Jazmin Dagostino, The Pew Charitable Trusts
1	Environmental justice experience	Nikita Vincent, Oregon Agricultural Trust David Mildrexler, Eastern Oregon Legacy Lands, Partnership for Policy Integrity
2	Conservation or environmental management	Megan Kemple, Oregon Climate and Agriculture Network Lauren Link, The Nature Conservancy
2	Landowner technical assistance	Dean Moberg, Tualatin Soil and Water Conservation District Andrea Kreiner, Oregon Association of Conservation Districts

**The Commission may appoint additional members as needed to provide additional expertise or represent other interests*

State Agency Coordination

An inter-agency working group met three times during the development process and provided information on the workforce through external partnerships, grant-making, and direct-hiring. Some agency staff participated in one-on-one interviews with the project team following working group meetings. The seven land managing agencies listed in the Natural Climate Solutions statute (ORS 468A.183-.199) include:

- Department of Agriculture
- Department of Fish and Wildlife
- Department of Forestry
- Department of Land Conservation and Development
- Parks and Recreation Department
- Department of State Lands
- Oregon Watershed Enhancement Board

Oregon Climate Action Commission Meetings

Finally, the Commission heard from the project team at three meetings in 2025 (July, November, and December). The first meeting introduced the project scope of work, the second covered the preliminary results and provided the opportunity for public input, and the third shared the results.

Workforce Partner Engagement

In addition to these advisory bodies, the project team engaged 29 workforce and Tribal partners and three Tribal Nations (see Appendix A) via one-on-one virtual interviews and inform the Study's findings and recommendations. Interviewees were a mix of Tribal workforce and natural resources staff, workforce development training program partners, and small and large contractors. Each interview followed a similar set of questions focused on understanding the needs of the NCS workforce and potential opportunities for supporting these workers.

Partner Interview Summary

The Study engaged partners from the following entity types:

- Practitioners (5)
- Workforce Contractors (5)
- Farm Service Providers (3)
- Nonprofits (3)
- Tribal Nations (3)
- Tribal-related Organizations (3)
- Workforce Development Boards (3)
- Labor Organizations (2)
- State/Regional Agencies (2)
- Workforce Training Programs (2)
- Other (2)

Study Components

The Study aimed to understand Oregon's existing workforce, gaps in the ability of the workforce to meet demand on N&WL, and opportunities for training new and current employees.

To explore these topics, the Study included a baseline assessment of the NCS workforce and research and development of profiles on key occupational and training programs, in addition to the engagement described in previous sections. This section briefly describes the approach for these tasks.

Determining Study Focus

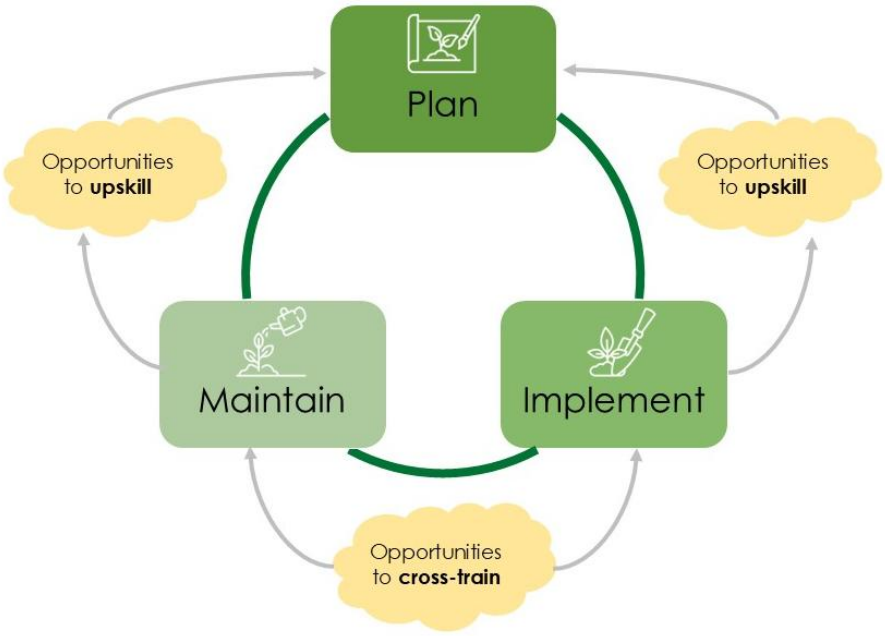
Working from the state definition of natural climate solutions, the project team and ODOE further clarified the sphere of natural climate solutions jobs that would be the focus for the Study. Having a focal group of jobs helped clarify interview questions and supported the development of an NCS industry definition for the workforce assessment.

To assist in organizing the range of workers needed to successfully expand and support NCS, the Study uses a framework that defines NCS work by project phase.
Work phases shown in **Figure 2** are:

(1) **Plan or Design Phase:** This phase involves developing project plans, conducting research, creating technical designs, and providing guidance for how systems or projects should be built and managed.

(2) **Implement or Build Phase:** This phase covers activities like construction, farming, planting schemes, and restoration — essentially, the physical work of building, producing, or installing what has been designed.

Figure 2: NCS Project Phases



(3) **Maintain, Monitor, or Steward Phase:** This phase keeps systems and environments operating over time. This workforce maintains habitat or plantings, for example, and equipment, monitors environmental conditions, and manages day-to-day operations once projects or systems are in place.

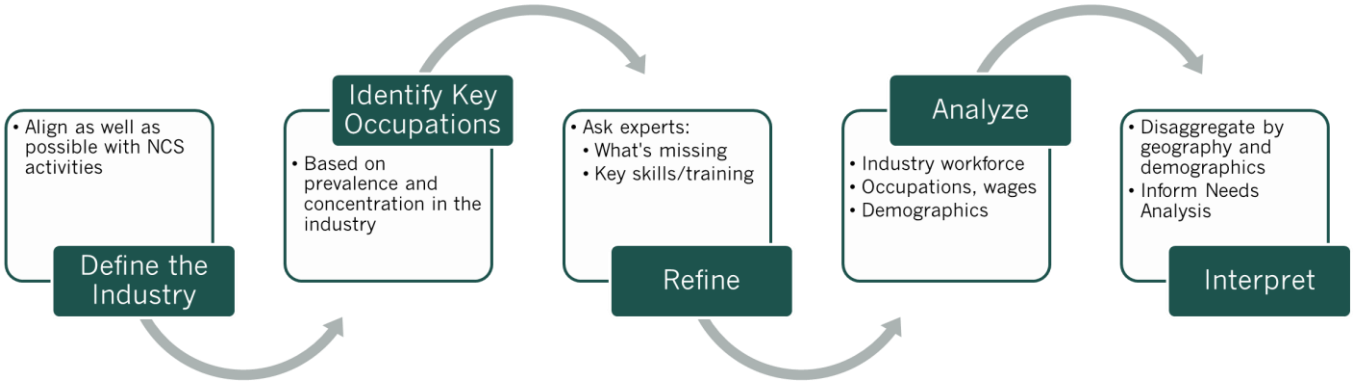
Many industries and occupations span multiple stages of NCS and overlap across sectors; this framework allows for a clearer understanding of cross-cutting roles.

Assessment of NCS Workforce

The Study analyzed foundational NCS workforce data to inform recruitment strategies, reveal potential retention challenges, and point to barriers that may affect long-term workforce sustainability. The workforce assessment analyzed: the industry and employer landscape; workforce trends over time; workforce characteristics; and workforce demographics. More information on the workforce assessment methods are in Appendices B, C, and D.

The project team used a five-part process for collecting and analyzing quantitative data on the NCS workforce (as depicted in Figure 3 and further explained in Appendix B).

Figure 3: Workforce Assessment Approach



This process included the following steps:

- **Define the NCS Industry***:* Because the term "Natural Climate Solutions" is not a formal industry category, to analyze the national industry data available, the project team needed to develop a definition for the NCS industry by identifying where NCS activities occur based on both quantitative and qualitative data, including ODOE's example list of natural climate solutions. The team aligned NCS activities with the industries and occupations that already exist in Oregon's labor market and that are most likely to be engaged in planning, implementing, or maintaining NCS projects. Through an iterative process, the project team identified a select number of industries based on criteria, including each industry's relation to performing NCS-related activities. Industries that could be considered ancillary support services or part of the supply chain that supports NCS planning, implementation, and/or stewardship were excluded from this study. Examples of excluded industries are manufacturing, wholesale trade, retail trade, real estate rental and leasing, legal services, and educational services. **Figure 2** provides the framework for the study by focusing on NCS project phases.
- Identify Key NCS Occupations: Once the NCS-related industries were defined, the project team identified the key occupations associated with them using Oregon's Industry–Occupation (IO)

matrix.[8] Standard occupation titles from the Standard Occupational Classification (SOC) do not always reflect the names by which occupations, professions, and jobs are known in the field. **Table 2** includes sample occupations, while a full list of formal titles cross-walked to common and alternative occupation titles used and shared during interviews and other engagement activities is included in Appendix D. The project team also developed a set of profiles on key NCS occupations. Occupations selected for profiles are listed in Appendix E along with two example profiles.

- **Refine NCS Industry and Occupation Definitions:** Throughout the process, interviews with NCS practitioners and ongoing discussions with interagency partners helped validate both the industry and occupation definitions. These qualitative insights provided important context for interpreting industry and occupational classifications and ensured that the technical methods accurately captured how NCS work is organized and performed in Oregon.

Table 2: Sample Rows from NCS Occupation Title Cross-walk

Soc Code	Occupational Title	Common/Alternative Titles	Count Of Mentions
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	Laborers, Farmworkers	6
11-9013	Farmers, Ranchers, and Other Agricultural Managers	Farm Manager, Farmers, Ranchers	9
37-3011	Landscaping and Groundskeeping Workers	Maintenance Crew	2
13-1082	Project Management Specialists	Project Manager, Conservation Planner, Natural Resource Project Manager, Restoration Project Manager, Assistance Program Manager	8

Profiles of Key Occupations and Training Programs

The Study collected occupation-specific information for key NCS occupations to guide the state's decision-making and strategy in this area. The project team summarized this information in a set of profiles (see Appendix E) that summarize job duties, current and projected employment, annual average openings, median wages, skills needed, education and training requirements, and demographics.

[8] Each occupation is cross-walked to the industries within the NCS definition, allowing calculation of two core measures: (1) share of industry employment (the percentage of an industry's workforce represented by a given occupation), and (2) share of occupation employment (the percentage of an occupation's total workforce employed within selected NCS industries). Where Oregon-level data were suppressed or insufficiently granular, national IO data are used to supplement the analysis and maintain coverage across occupations.

The Study also collected information on existing workforce development and training programs in Oregon. The project team summarized this information in a set of profiles (see Appendix G) that collectively make up a set of consistent data on these programs across land types and regions. For each program, the profiles summarize the credential or degrees awarded, related occupations, eligibility and prerequisites, populations served, program frequency, and supplementary supportive services offered.

Profiled Programs:

(1) offer unique or innovative curricula in climate-solution or NCS training,

(2) target populations that are underrepresented in the natural resource field, and

(3) provide unique services beyond training (e.g., housing or transportation solutions).

Study Limitations

The project team encountered the following limitations with this Study's analysis:

- ***Partner Engagement Timeframe:*** The short timeline for the Study's engagement limited the number of partners that could be reached. The project team addressed this limitation by extending engagement as long as possible within the project timeline and following up persistently with interviewees. An Addendum to this report with key findings from interviews with NCS-related labor organizations will be available in January 2026.
- ***Tribal Nation Engagement Timeline:*** The Study's short timeline also created challenges for engagement with Tribal Nations. Meaningful engagement with Tribal Nations requires long-term relationship-building that cannot fit effectively within a short time frame. Further, the Study period was a busy time for many representatives of Tribal Nations who could not provide input due to limited capacity. The project team addressed this limitation by extending Tribal interviews as long as possible in the project timeline and following up with Tribal Nation representatives. An Addendum to this report with key findings from interviews with Tribal organizations and Tribal Nations will be available in January 2026.
- ***NCS Industry Definition***: The NCS Industry definition relies on data from the North American Industry Classification System (NAICS). NAICS organizes economic activity into standardized codes that allow analysis at multiple levels of detail, depending on the data source. Industry codes rarely align exactly with the full set of activities involved in NCS work, and all industries contain a mix of NCS and non-NCS activities. The project team addressed this limitation by developing the Study's own definition of the NCS Industry.
- ***Standard Occupation Titles:*** Standard occupation titles do not always reflect the names by which jobs are known in the field (e.g., ecologists and naturalists employed by the restoration sector are not easily identified in the data). The project team addressed this limitation by developing a cross-walk of standard and commonly known titles (as shown in Appendix D).
- ***Restoration Industry:*** Habitat restoration across land types is difficult to discern in the datasets used to assess the NCS workforce. While some limitations were addressed, some conclusions are drawn for the agricultural and forestry sectors that were not able to be made specifically for NCS. Traditionally, the agriculture and forest industries are more established in the datasets available for these types of assessments.

EVALUATION OF THE NCS WORKFORCE

This Study evaluated the robustness of the NCS workforce, and identifies strengths, weaknesses, opportunities, and threats in its ability to meet the state's forthcoming nature-based climate goals. The evaluation connects findings of all Study components. Statements are informed by feedback from the working groups and partner engagement conducted throughout the project, grounded in the available data used to assess the workforce, and serve as the basis for the recommendations in this Study. This section is organized into the following topics:

Strengths

Characteristics of the sector that may present an advantage over other sectors.

Weaknesses

Characteristics that, if they persist, may create further disadvantages and hinder the state's ability to meet its climate goals.

Opportunities

External factors that the sector can leverage to its advantage.

Threats

External factors that could present long-term challenges for the sector and hinder the state's goals.

Strengths

- **There is high demand for restoration work in Oregon.** Restoration work includes invasive species removal, riparian planting, and wildfire mitigation, among other natural climate solutions. Almost all interviewees indicated that there is no shortage of work to be done to mitigate and adapt N&WL to climate change. The need for these jobs will continue to grow as climate impacts intensify and the state sets a goal for increasing NCS.
- **There are already successful youth training programs throughout the state.** These programs hold significant promise to train a strong cohort of future workers in NCS. With greater resources, these programs could expand their capacity to advance this critical work.
- **NCS workforce demographics are shifting toward more gender and racial diversity.** Industry leaders observed that effective workforce training, better access to education, and increased career awareness have driven diversity in the workforce, although the workforce assessment indicates that this trend is uneven across occupations.
- **Many public sector NCS jobs are desirable and pay well.** Local, state, and federal government NCS jobs are generally good quality, offering stable employment and benefits. These jobs are viewed as favorable destinations for NCS workers seeking career advancement.

Weaknesses

- **Restoration crew jobs are demanding and often have low pay.** Restoration crew jobs include the restoration and vegetation management work to implement NCS through planting, spraying, thinning, and other manual tasks. Contractors are engaged by project planning entities like firms or government agencies to execute projects. The jobs often come with low wages, seasonal work, physically demanding tasks, few advancement pathways, and infrequent credentialing opportunities for workers. These factors make it difficult for field crew workers to build long-term careers in the restoration industry. Interviewees cited incidents of negative worksite culture, including racism and harassment.
- **Of the low paid NCS occupations, farm worker jobs are the lowest paid and often offer limited benefits.** These jobs make up the lower spectrum of wages, benefits, and working conditions, with farmworkers facing additional employment precarity due to job seasonality, unstable immigration status, and prevalent contract-based employment. See Appendix F, Figure F.3, for specific NCS occupation wage differences.
- **Rural areas of the state have a smaller pool of candidates for NCS planning roles due to the limited training and educational resources available in those regions.** Rural organizations and agencies have a difficult time recruiting and retaining qualified candidates for vital NCS positions as a result.
- **Many organizations rely on grants with numerous administrative requirements and short timelines that hinder their ability to develop long-term plans.** Many organizations, including land management nonprofits and Soild and Water Conservation Districts (SWCD), must "piece together" grants for NCS project funding and struggle to secure funding for staff salaries since most grants do not cover overhead expenses. Further, grants run on short cycles, which limits grantees' ability to plan for appropriate staffing and long-term NCS projects.
- **Workforce development efforts are impeded by many individuals' inability to meet basic needs.** The cost of and lack of access to affordable housing, childcare, transportation, and education present persistent barriers to entering and sustaining NCS careers. Many individuals must focus on addressing their day-to-day needs, which hinders their ability to seek out additional training or skills development.

Opportunities

- **There is unmet demand for NCS workers in rural regions of Oregon.** As a result, there are many ready-to-go projects hindered by the limited NCS workforce. State investment in training programs for rural residents would help contractors meet NCS demand and increase hiring in these areas.
- **Project management skills are in high demand for NCS-related work.** Interviewees noted the importance of project managers having broad, functional knowledge across multiple areas to understand a project's context, guide a team, and make informed decisions. There is an opportunity to support early career project managers in building cross-functional expertise to be successful.
- **Youth are excited about careers in natural resource management, restoration, and conservation.**[9] Several interview participants espoused this growing interest. If this enthusiasm is

[9] https://cfans.umn.edu/news/survey-careers-calling

effectively channeled into the state's exemplary youth programs, Oregon would be able to secure a robust NCS workforce.

- **NCS careers offer strong career pathways for formerly incarcerated individuals re-entering the workforce.** Re-entry programs can be further developed to support these workers in restoration careers.

Threats

- **Changing federal priorities are creating uncertainty for NCS employers, funders, and workers.** The federal government has historically driven much of the funding for planning and implementing NCS on Oregon's N&WL.
- **Some NCS roles depend on an immigrant labor force which is vulnerable to Federal Immigration actions.** Many NCS jobs like forest crews labor and farmwork are highly reliant on workers drawn from H-2A and H-2B visa programs as well as the undocumented workforce.
- **NCS field workers are increasingly susceptible to heat-related illness due to climate change's worsening effects.** With hot weather arriving earlier in the year, this threat is expected to rise.

NCS WORKFORCE ASSESSMENT

The Study assessed the NCS workforce to provide foundational information that can guide workforce planning and future investment in NCS across Oregon. This section summarizes the key takeaways from this quantitative assessment.

General Themes

1. **Most NCS industries are growing, with opportunity for additional training.**

   As Oregon aims to increase levels of NCS activity, room for growth can be found across and within relevant industries, as only portions of some industries are currently doing NCS-related work. Workers with adjacent skillsets can develop NCS-specific skills — through existing or new training pathways, or on-the-job training — that prepare them to transition fully or partially to NCS work.

2. **Oregon's NCS workforce conducts a wide array of activities across the state's natural and working lands, requiring a range of skills.**

   The broad range of NCS activities is essential to help the state meet its policy to accelerate NCS implementation. NCS industries and occupations require a wide range of skills and training due to the diversity of NCS activities. Workers and businesses contribute to improved land management, fire management, avoided conversion of natural and working lands, land restoration, conservation agriculture, and many other natural climate solutions.

3. **The prevalence of NCS subindustries differs by region, as do the median wages for NCS occupations.**

   Regional differences in NCS workforce concentration and pay are key components of workforce planning and development. Subindustries are distributed differently across regions and a region's industry mix is an important component in workers' decisions about what training and jobs to pursue. Compared to regional medians across Oregon, occupation median wages are generally higher for architecture/engineering and life/physical/social science NCS occupations, lower for grounds maintenance occupations, and a mix for farming and forestry occupations. Workforce recruitment and retention are likely more difficult in places where key NCS occupations pay less than the regional median.

4. **NCS industries face ongoing workforce challenges similar to those in other industries, including demographic disparities that require targeted recruitment and training efforts.**

   Women remain underrepresented, especially in labor-intensive roles, and BIPOC workers are not equally represented across occupations. These dynamics present opportunities to expand recruitment efforts, promote diversity, and support and develop training programs that attract new talent to ensure NCS workforce sustainability.

Specific Findings

Workforce assessment findings are organized in four sections:

- Industry and employer landscape
- Workforce trend over time
- Workforce characteristics
- Workforce demographics.

Each section contains call out boxes with the major questions posed and followed by summary bullets of the findings.

Industry and Employer Landscape

NCS employment spans a wide range of industries, from NCS-specific to less-NCS-specific industries (see Figure **4**). The former refers to industries primarily engaged in NCS-related work, while the latter includes industries that may employ NCS workers but do not center their core activities around NCS-related work.

Industry-level data are organized at the establishment or employer level and encompass all types of work and employment in an industry, regardless of a worker's occupation. The highest employment levels are found in truck transportation, architectural and engineering services, and landscaping services — the less-NCS-specific industries. NCS-specific industries with the highest levels of employment are agricultural in focus: support activities for crop production, greenhouse and nursery production, and fruit and tree nut farming. These industries are primarily composed of private employers, with little public sector employment.

Public sector roles — largely within state, local, and federal agencies — are concentrated in specific industries such as administration of environmental quality programs, conservation and wildlife organizations, timber tract operations, and nature parks.

What industries do NCS-related work?

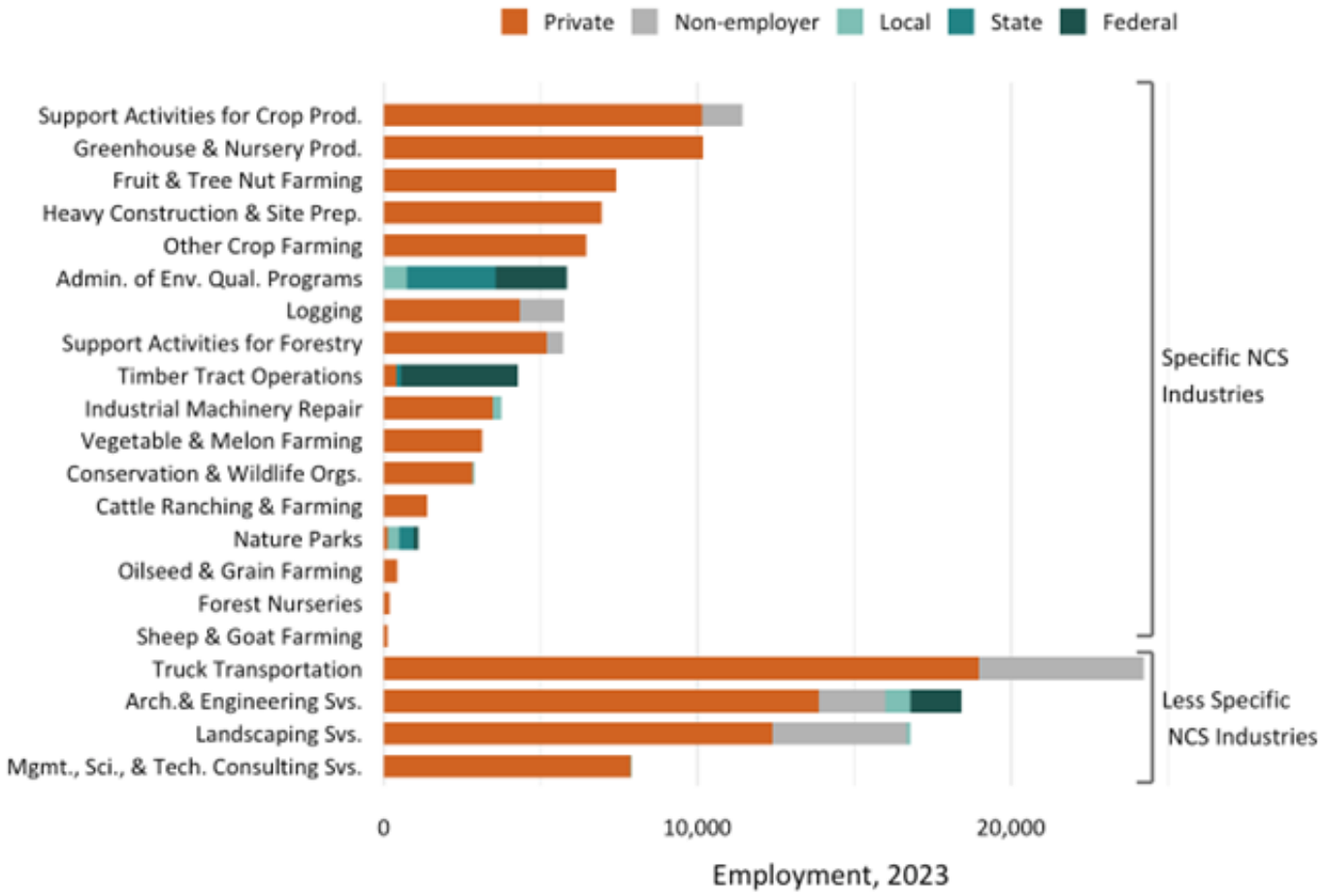
- A wide range of industries employ NCS workforce but do not center their core activities around NCS-related work.
- While large firms employ the most people; small firms dominate the sector.
- Non-employer establishments, individual proprietors, and self-employed workers represent 11 percent of the NCS workforce.

What Are the Characteristics of Employers That Do NCS-Related Work?

- Heavily reliant on the private sector that span all NCS occupations.
- Public sector plays a critical role in environmental quality, conservation, and land stewardship functions.
- Compared to Oregon as a whole, NCS jobs pay less.
- While Metro area may account for largest share of jobs overall, rural and resource-dependent regions are more reliant on NCS-related employment as a share of their local economies.

Figure 4 highlights two key features of Oregon's NCS workforce: (1) it is heavily reliant on private employment in industries that span agricultural, forestry, construction, technical, transportation, and land management services; and (2) public employment plays a critical role in environmental quality, conservation, and land stewardship functions.

Figure 4: NCS Workforce Employment by NAICS Group and Ownership, Oregon 2023



Data source: Oregon Employment Department, QCEW, 2023, 4-digit NAICS groups. U.S. Census Bureau, Non-employer Statistics (NES), 1-year estimates, 2023. Notes: NES estimates are suppressed for some industries.

In nearly all specific NCS industries and less specific NCS industries studied, establishments with one to five employees account for the largest share; in NCS industries overall they represent more than half of all businesses (see **Figure 5 and Figure 6**). This pattern is especially noticeable in management and consulting services, farming, and landscaping. Large firms, with over 100 employees, are relatively rare across most industries other than public administration and a few capital-intensive industries, like timber tract operations.

Although small establishments make up the largest proportion of NCS firms, they employ a comparatively small share of the total workforce (see **Figure 6**). Larger firms, though fewer in number, account for the majority of NCS employment. Establishments with over 100 employees and those with 26 to 100 employees, each make up just less than one-third of total employment across NCS industries. Industries such as administration of environmental quality programs and nature parks have especially high shares of employment concentrated in large establishments (see **Figure 5**). Professional and technical services and agricultural production are more evenly distributed, with employment spread across a broader range of firm sizes. Compared to Oregon overall, NCS industries employ more workers in small firms (fewer than 25 employees) as indicated in the bottom rows of **Figure 5**.

Figure 5: Establishments by Firm Size, 2023

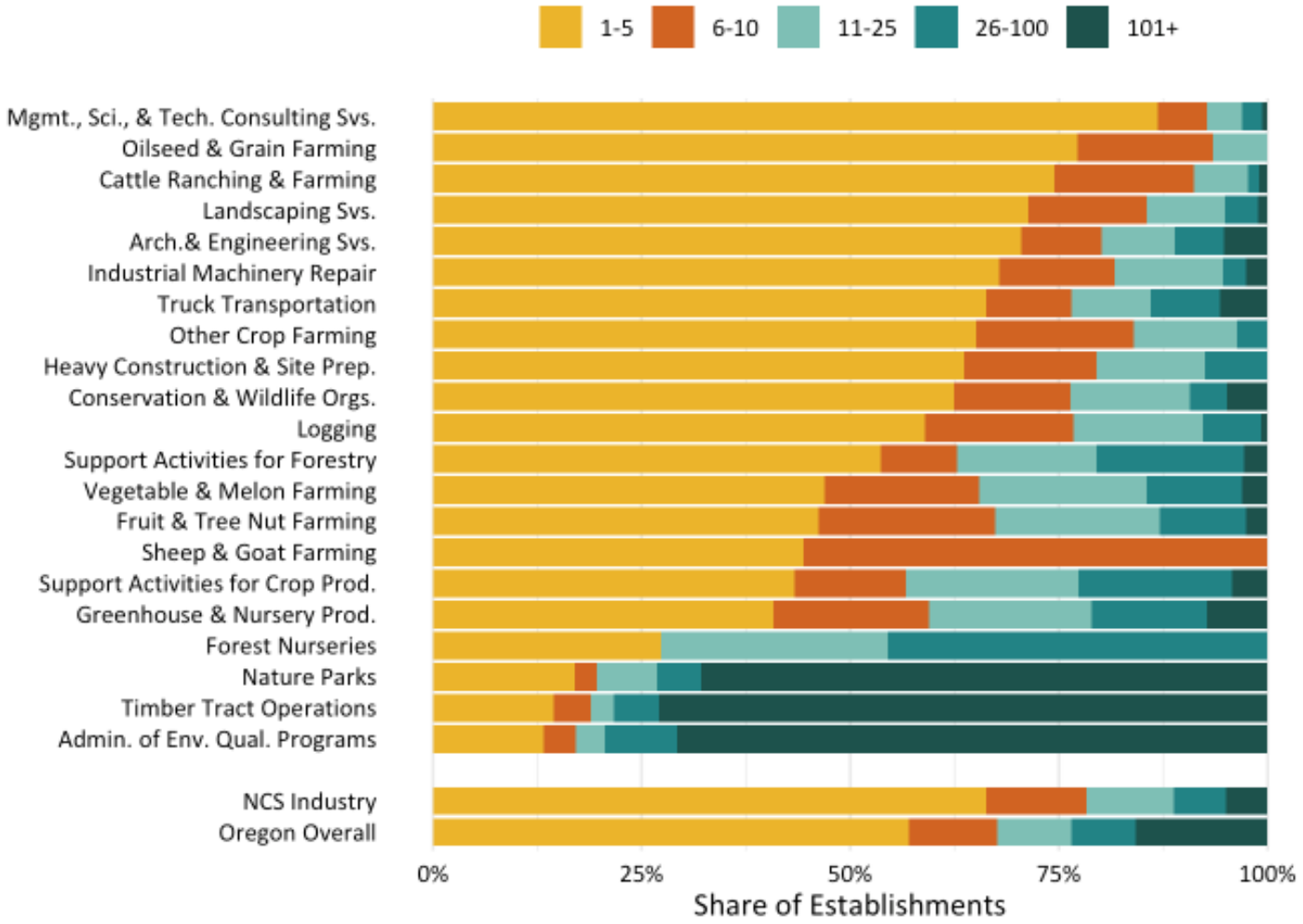
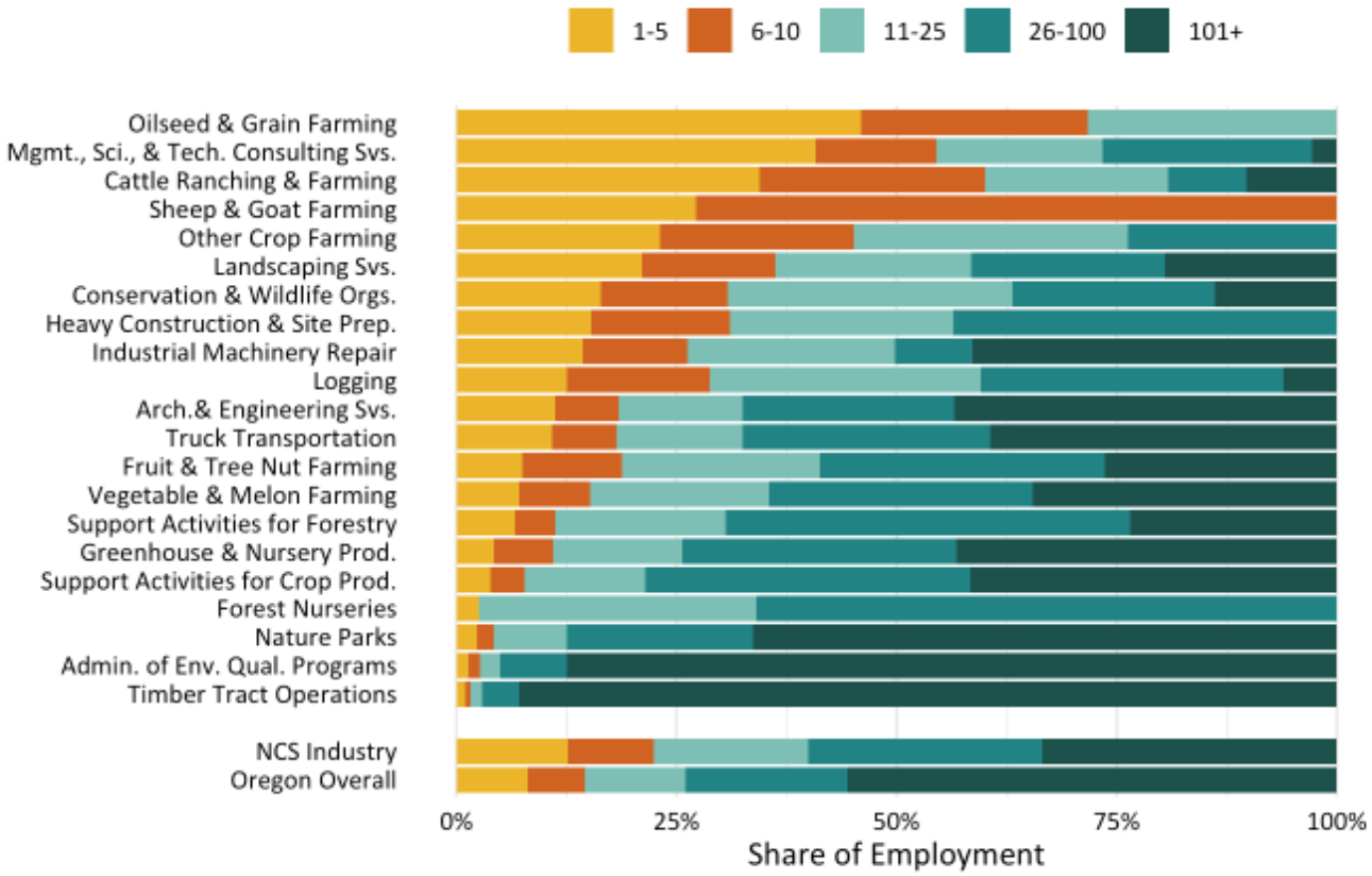


Figure 6: Employment by Firm Size, 2023



Data source: Oregon Employment Department, QCEW, 2023.

While average pay varies by region of the state and industry, compared to Oregon as a whole, NCS jobs have lower pay per employee ($66,612 for NCS industries compared to $68,064 for all industries statewide; see **Table 3 and Table 4**). Average pay for more specific NCS industries is lower: $57,452 statewide and ranging from $49,592 in Mid-Valley to $77,587 in the Portland Metro.

The Portland Metro, Mid-Valley, and East Cascades areas have the highest numbers of NCS employees and establishments, with over 78,000 workers in those three regions. Other regions, including Northwest and Southwestern Oregon, are home to the smallest NCS workforces. Geographic distribution of subindustries plays a role in these differences.

The industries with the largest NCS employment and establishment counts statewide are crop production, professional and technical services, and truck transportation. Pay per employee is highest for professional and technical services and industrial machine repair.

Table 3: Distribution of NCS Employment, Establishments, and Average Pay by Region

Region	NCS Employment	Number of Establishments	NCS Average Pay per Employee	Specific NCS Industries, Average Pay per Employee
Clackamas	11,749	1,635	$67,144	$54,856
East Cascades	14,222	2,374	$63,434	$55,128
Eastern Oregon	10,598	1,216	$53,991	$51,004
Lane	7,312	1,098	$62,680	$60,221
Mid-Valley	27,236	2,843	$52,721	$49,592
Northwest Oregon	5,500	989	$64,953	$64,372
Portland-Metro	36,642	4,616	$84,746	$77,587
Rogue Valley	8,762	1,284	$55,670	$51,790
Southwestern Oregon	5,060	773	$59,631	$60,261
Oregon	**129,518**	**18,280**	**$66,612**	**$ 57,452**

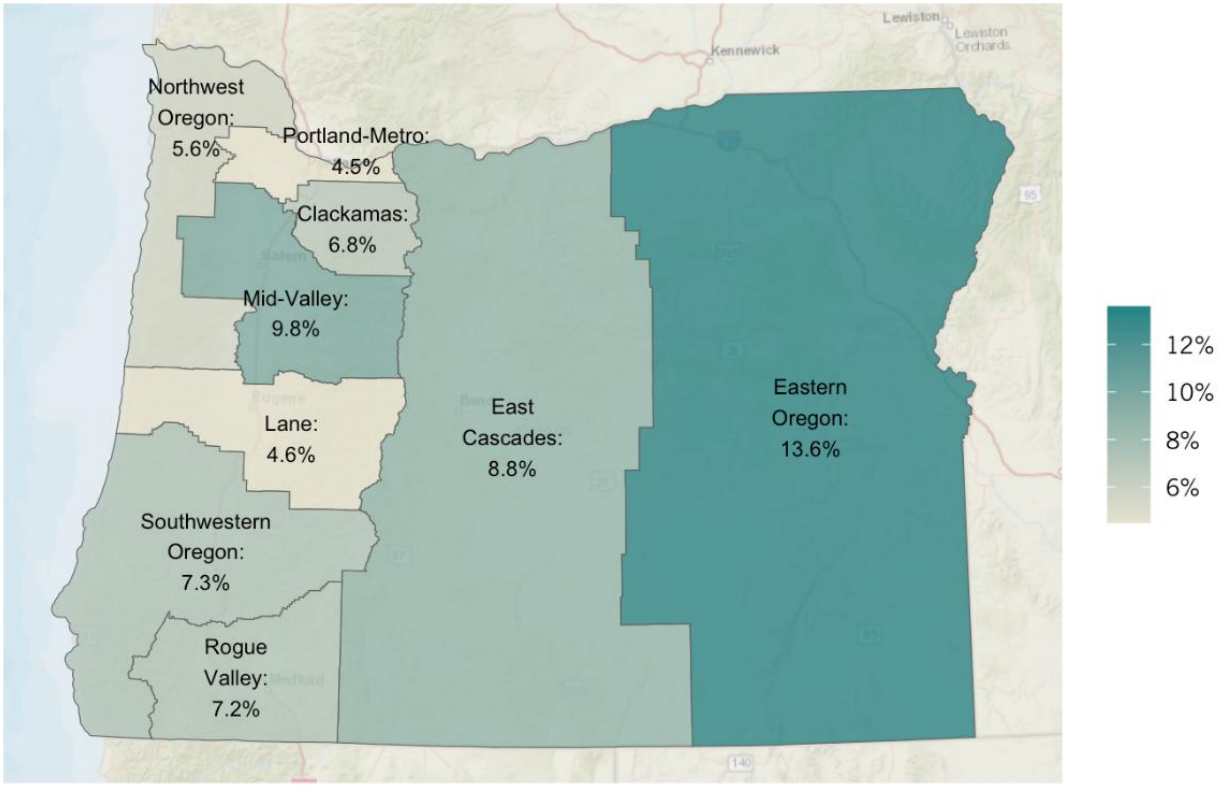
Table 4: Distribution of NCS Employment, Establishments, and Average Pay by Industry, 2023

NAICS Group	NAICS Code	NCS Employment	Number of Establishments	NCS Average Pay per Employee
Crop Production	111	27,568	2,839	$43,100
Support for Ag. and Forestry	115	15,361	975	$43,192
Admin. of Envi. Quality Prog.	924	5,839	288	$83,946
Site Preparation	238	5,554	872	$73,210
Logging	113	8,791	749	$76,584
Industrial Machinery Repair	811	3,748	531	$100,855
Conservation and Wildlife Orgs.	813	2,892	470	$62,556
Cattle, sheep, and goat farming	112	1,505	393	$42,887
Heavy Construction	237	1,453	158	$94,319
Nature Parks	712	1,114	113	$53,196
Prof., Sci., and Tech. Services	541	24,201	5,958	$103,317
Truck Transportation	484	18,972	2,545	$67,183
Admin. and Support Services	561	12,521	2,389	$48,802
Total	**-**	**129,518**	**18,280**	**$66,612**

Table 3 and 4 Data source: Oregon Employment Department, QCEW, 2023. Note: In the second panel, less-specific NCS industries are listed at the bottom. QCEW data reflect average pay per employee, which may differ from a typical worker's wages.

Eastern Oregon is the most NCS-dependent region by NCS employment as a share of total regional employment, with 14 percent of its total workforce in NCS industries, followed by Mid-Valley at 10 percent and East Cascades at 9 percent (see **Figure 7**).[10] By comparison, larger urban centers such as Lane and Portland Metro show the lowest shares (5 percent each), despite having high numbers of NCS workers. This indicates that while Portland Metro may account for the greatest number of NCS-related jobs overall, rural and resource-dependent regions are more reliant on NCS-related employment as a share of their local economies.

Figure 7: NCS Employment as a Share of Region's Total Employment, 2023



Data source: Oregon Employment Department, QCEW, 2023

[10] These three regions maintain the highest NCS employment as a share of total regional employment when considering only NCS-specific industries (i.e., excluding less-specific NCS industries).

Workforce Trends Over Time

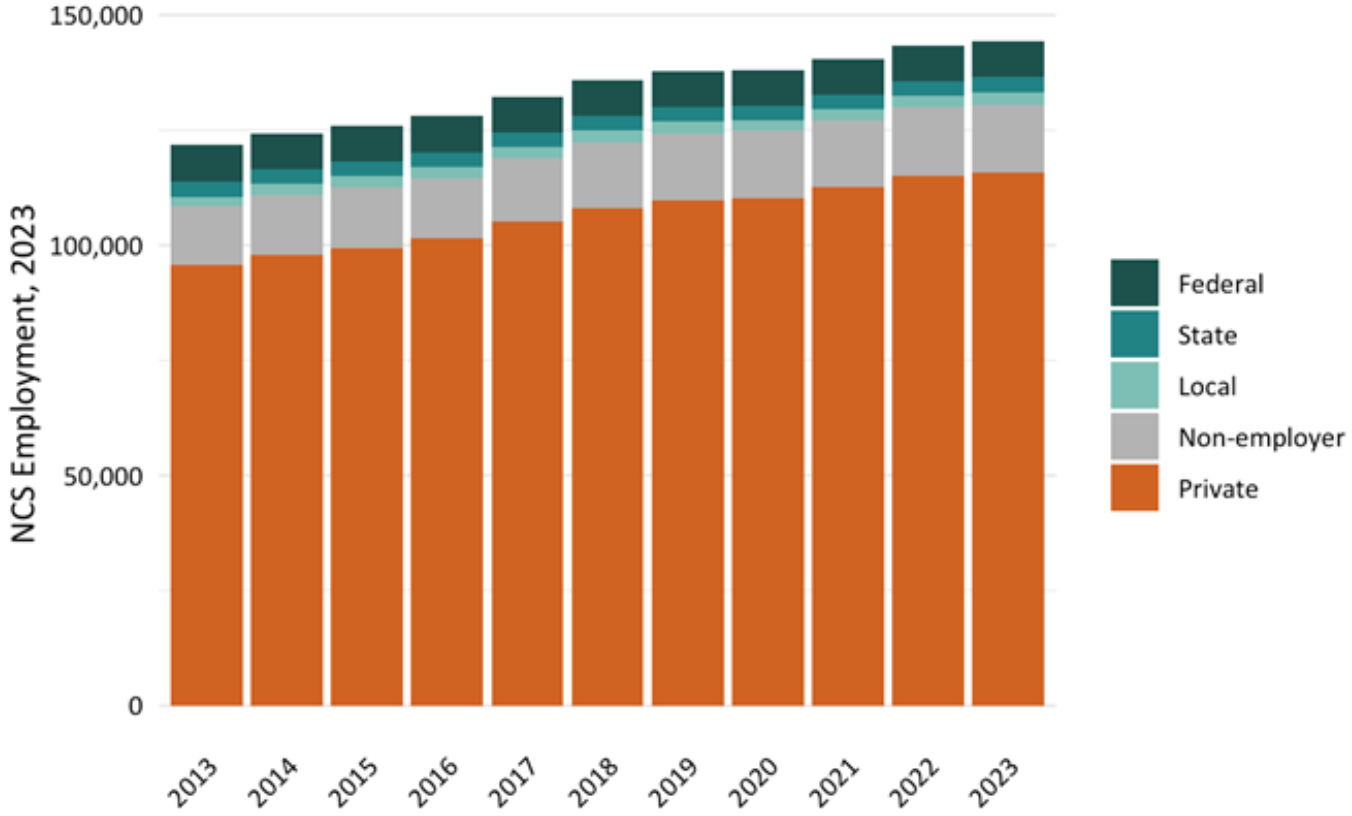
NCS employment in Oregon has grown steadily over the past decade, driven primarily by private-sector activity (see **Figure 8**). Private employers account for 82 percent of NCS jobs. Private employment has expanded consistently since 2013, at 2.1 percent per year, reflecting a growing demand for services in conservation, sustainable land management, and climate-focused planning and implementation. Non-employer establishments, individual proprietors, and self-employed workers represent 11 percent of the NCS workforce (1.7 percent annual growth since 2013), and government workers represent the remaining 7 percent (-0.1 percent annual change since 2013).

Public-sector employment in NCS, including federal, state, and local agencies, has remained relatively stable over time. This employment is concentrated in establishments that support environmental regulation, resource management, and public land stewardship. Together, public and private employment trends suggest a growing sector where change is largely market-driven, supplemented by steady government investment and oversight.

How Has the NCS Workforce Changed Over Time?

- Private employment has expanded consistently since 2013.
- Public sector employment in NCS (federal, state, local) has remained relatively stable.
- Change appears to be largely market-driven, supported by steady government investment and oversight.
- Employment in the planning and designing aspects of NCS projects has seen the strongest growth.
- Many specific NCS-related industries have remained steady since 2013.
- NCS employment fluctuates throughout the year, reflecting the effects of seasonal and weather-related conditions of the work.

Figure 8: NCS Workforce Employment by Ownership, Oregon

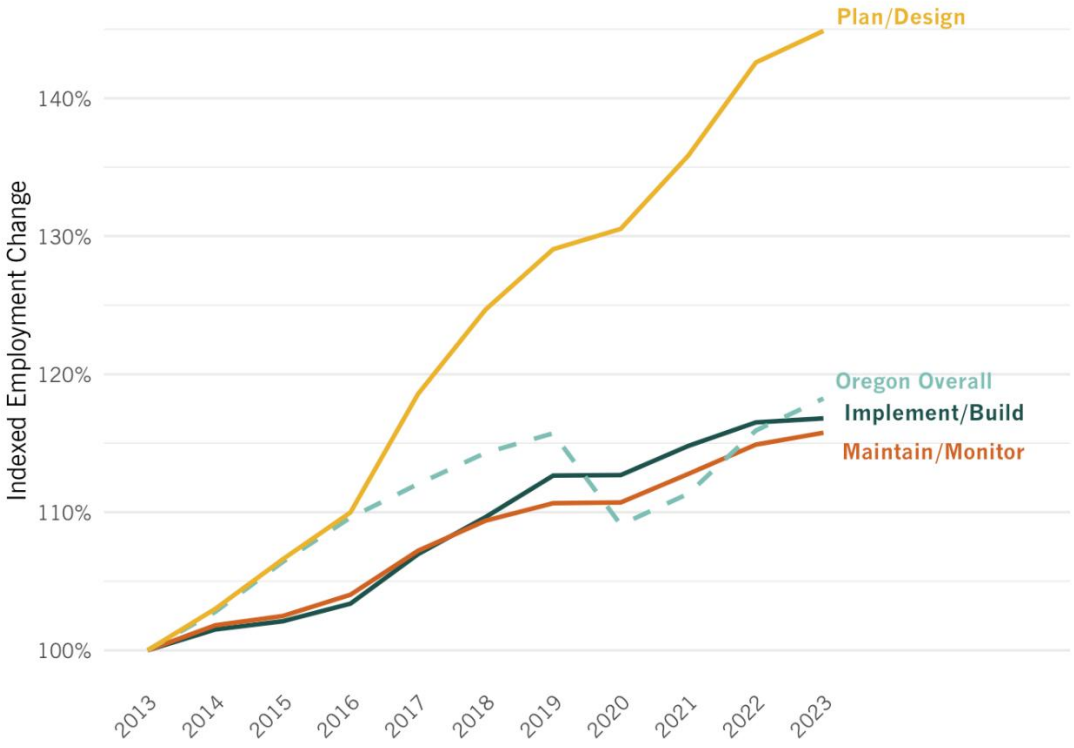


Data source: Oregon Employment Department, QCEW, 2013-2023. U.S. Census Bureau, Non-employer Statistics, 1-year estimates 2013-2023.

Across the plan/design, implement/build, and maintain/monitor categories, there is substantial overlap. Most establishments are not limited to a single function but instead could engage in multiple phases of a project. Specifically, about 65 percent of NCS employment conducts work in two or three of the categories. For example, workers involved in the plan/design phase of work may also contribute to activities in the maintain/monitor phase. As a result, employment figures across these categories reflect some duplication (see **Figure 9**).

Employment in the industries supporting the planning and designing aspects of NCS projects has seen the strongest growth of the three categories and compared to overall Oregon employment. Professional/technical services, a less-specific NCS industry, is driving some of the growth in this category. Employment in the Maintain/monitor and implement/build phases has tracked the larger Oregon trend. The NCS workforce did not experience the same decrease in growth as the overall Oregon workforce during the COVID-19 pandemic in 2020.

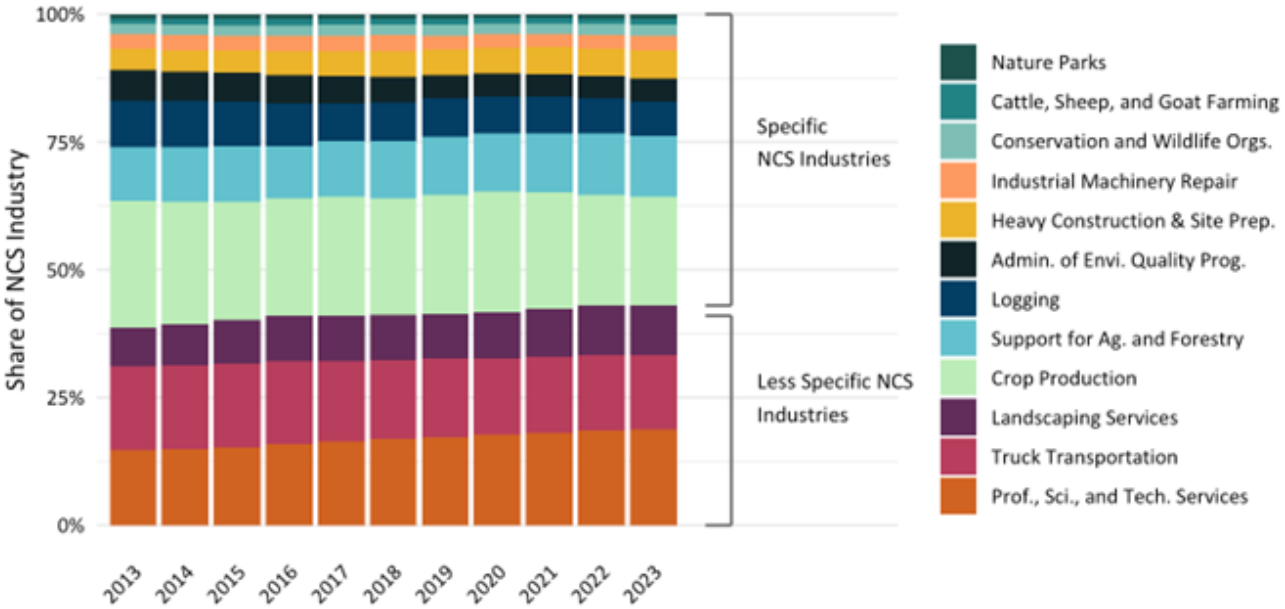
Figure 9: Employment Change by NCS Industry Categorization, Oregon



Data source: Oregon Employment Department, QCEW, 2013-2023.

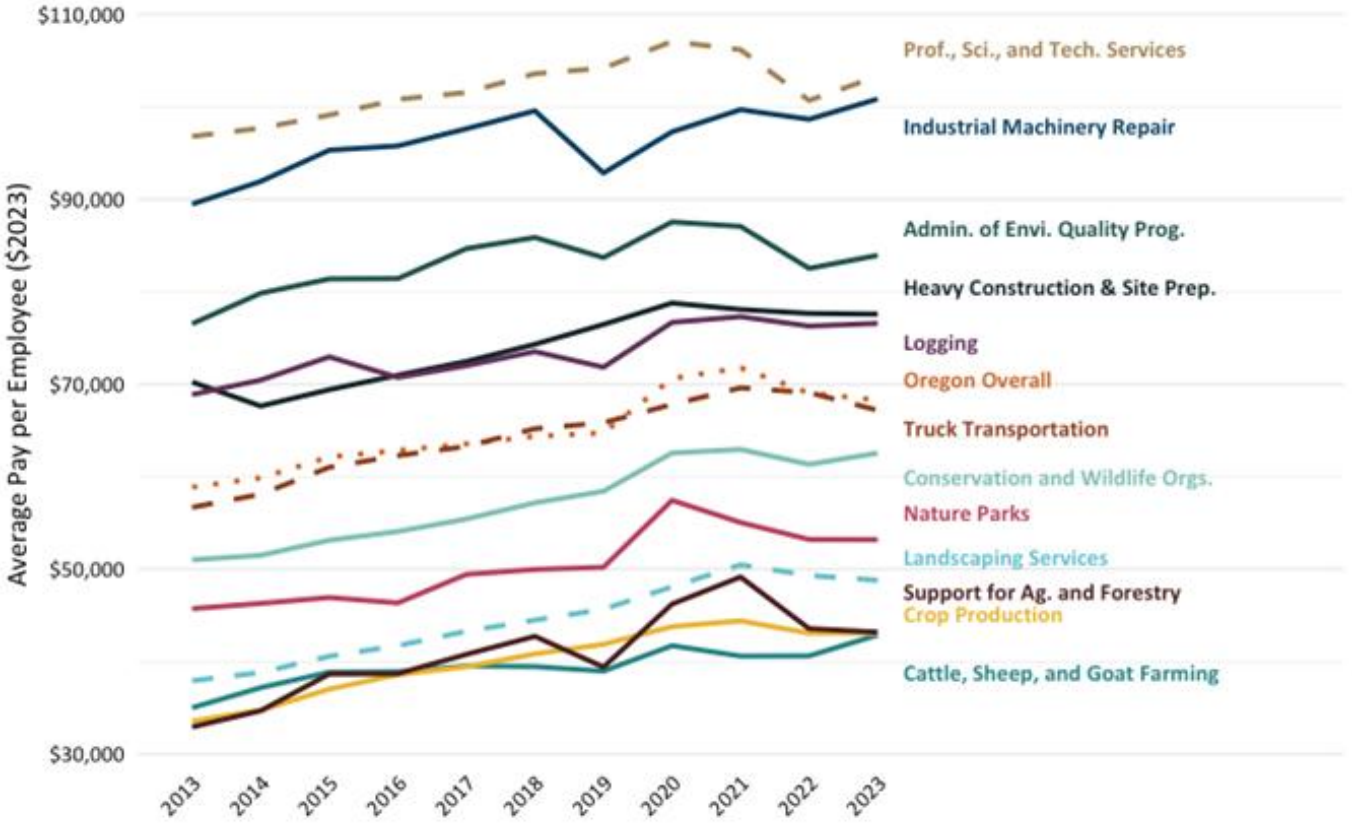
Crop production continues to make up the largest share of NCS-related employment activity, though its share has gradually declined over time (see **Figure 10**). In contrast, professional, scientific, and technical services have grown substantially in its share. Many NCS-specific industries, such as logging, industrial machinery repair, conservation and wildlife organizations, and nature parks have held relatively steady since 2013.

Figure 10: Industrial Composition of NCS Employment, Oregon



Data source: Oregon Employment Department, QCEW, 2013-2023, 3-digit NAICS groups.

Figure 11: Real Average Pay per Employee in NCS Industries, Oregon



Data sources: Oregon Employment Department, QCEW, 2013-2023, 3-digit NAICS groups, and BLS Consumer Price Index (CPI), 2023. Solid lines are NCS-specific industries; dotted lines are less-NCS-specific.

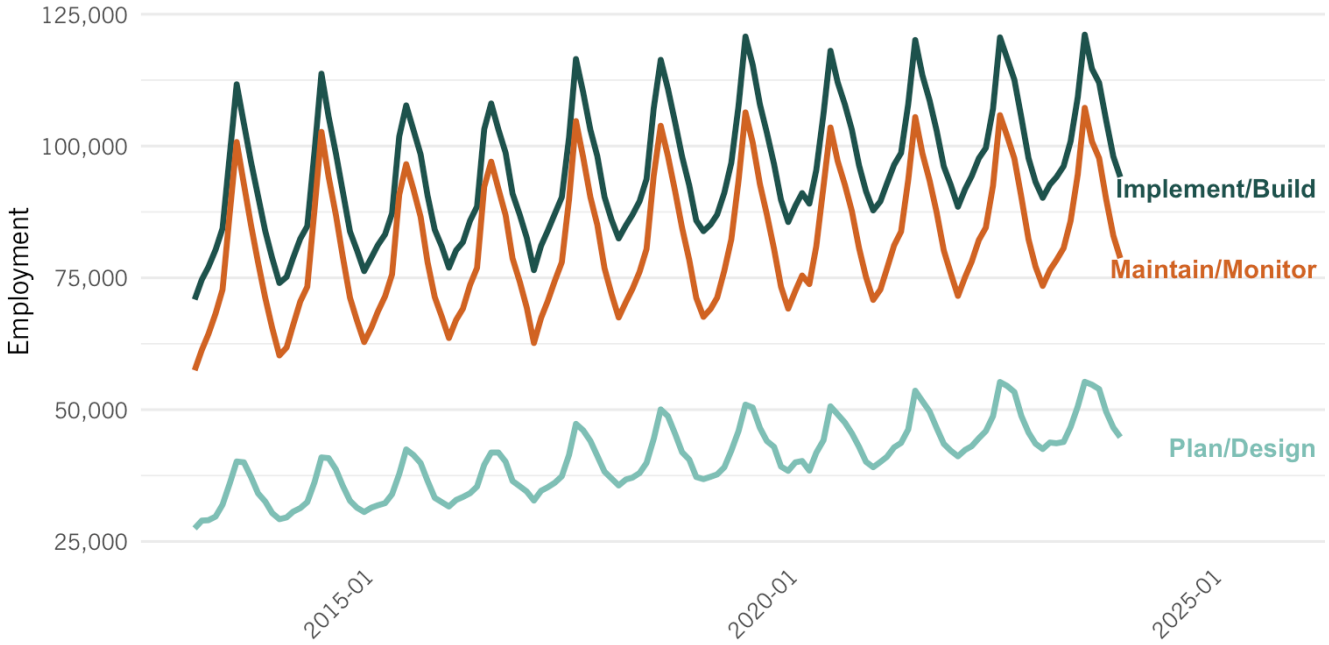
Average pay has increased since 2013, though at varying rates by industry group (**Figure 11**). When compared to the Oregon average some industries pay above the Oregon average while others fall below. NCS-specific industries are indicated by solid lines, whereas dotted lines indicate industries that are less-NCS specific. NCS-specific industry groups like industrial machinery repair, administration of environmental quality programs, and heavy construction have higher average pay per employee than the Oregon average. Other NCS-specific industry groups, such as conservation and wildlife organizations, logging, nature parks, and crop production, fall below the overall Oregon average. Work that involves planning and specialized expertise tends to pay more, while hands-on and production work continues to earn less, on average.

NCS employment fluctuates throughout the year, reflecting the effects of seasonal and weather-related conditions of the work. However, the degree of seasonality varies across NCS phases (**Figure 12**). Plan/design employment is 38 percent higher at its peak, relative to the annual low point. Implement/build employment is 43 percent higher, and maintain/monitor employment, with the strongest seasonality, is 57 percent higher.

Planning and design work is most likely to occur throughout the year, whereas favorable weather and field conditions may dictate maintenance and monitoring, leading to moderate peaks in employment in the months when activities associated with projects may occur. Implementing and building are similar in that employment also depends on the timing of fieldwork, construction activity, and associated salmon-in-water work windows for wetland, floodplain, and river-associated work, but these activities may have somewhat less seasonality because projects may span multiple months, or years, and thus continue to require coordination, logistics, and oversight.

Again, substantial overlap exists in industries and employment between NCS project phase categories (65 percent of employment is in two or three categories). Agriculture and forestry industries are the main drivers of seasonal employment, specifically fruit and tree nut farming and support activities for forestry and crop production. Data limitations, described earlier in this report, may result in missing other industries that commonly experience seasonal employment including restoration work that focuses on other non-forested natural areas (e.g., wetlands, rangelands, floodplains, prairies).

Figure 12: Seasonality in NCS Employment, Oregon



Data source: Oregon Employment Department, QCEW, 2013-2023.

Workforce Occupations and Wages

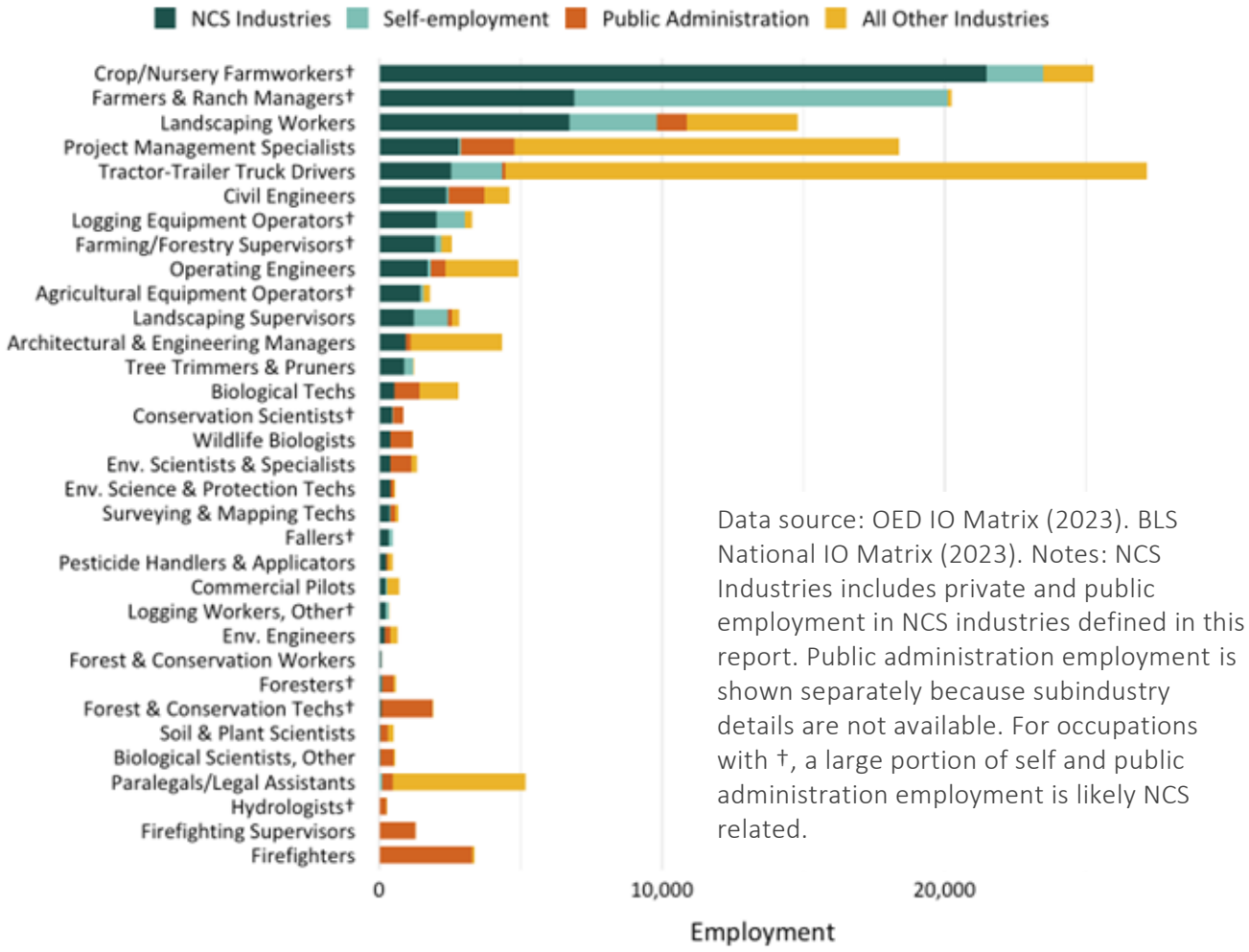
Oregon's NCS workforce requires a wide range of skills due to the diversity of activities across its industries. Occupational needs range from highly skilled technical positions, such as environmental engineers, hydrologists, and conservation scientists, to equipment-based roles like logging equipment operators, tree trimmers and pruners, farm workers and laborers.

Most NCS employment is concentrated in a few dozen occupations. Some occupations are mostly NCS (e.g., forestry supervisors) while others are widespread across many industries (e.g., project management specialists and tractor-trailer truck drivers) (see **Figure 13**). Occupations with high concentration in NCS industries will likely require different workforce development approaches than occupations that are more distributed across industries. Further, many NCS workers are self-employed, presenting additional opportunities for workforce and small-business development.

What Occupations Comprise the NCS Workforce?

- Though all nature-based, the wide range of skills needed for the many different activities across industries means the occupations are diverse.
- Some apply across land types whereas others are specific to land type or place-based.

Figure 13: Employment in Key NCS Occupations by Type of Employment, Oregon, 2023



Data source: OED IO Matrix (2023). BLS National IO Matrix (2023). Notes: NCS Industries includes private and public employment in NCS industries defined in this report. Public administration employment is shown separately because subindustry details are not available. For occupations with †, a large portion of self and public administration employment is likely NCS related.

Many existing occupations currently do, or could, implement natural climate solutions. The project team identified several occupations that cut across all land types (and associated workforce sectors), while others are more specific to a given land type. **Table 5** provides examples of key NCS occupations by land type.

Table 5: Examples of Key NCS Occupations by Land Sector.

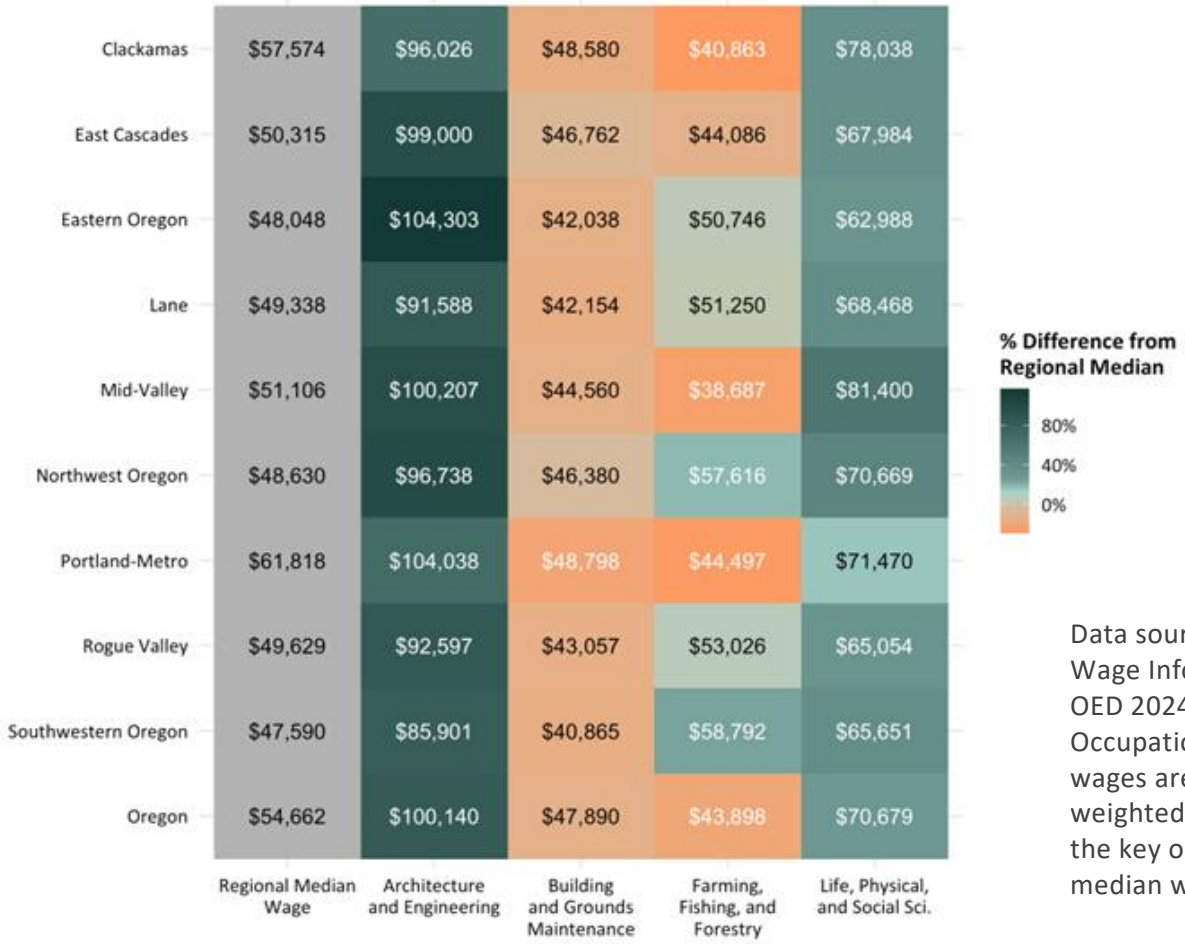
Land Type	Occupations
All	• Biological Technicians • Commercial Pilots • Conservation Scientists • Environmental Engineers • Pesticide Handlers, Sprayers, and Applicators, Vegetation • Surveying and Mapping Technicians
Urban Greenspace	• First-Line Supervisors of Landscaping, Lawn Service, and • Groundskeeping Workers • Tree Trimmers and Pruners • Zoologists and Wildlife Biologists
Forest/Shrubland	• Fallers • First-Line Supervisors of Farming, Fishing, and Forestry Workers • Foresters • First-Line Supervisors of Firefighting and Prevention Workers • Firefighters • Forest and Conservation Workers • Logging Equipment Operators • Surveying and Mapping Technicians
Wetland (including waterways)	• Biological Technicians • Conservation Scientists • Environmental Engineers • Environmental Science and Protection Technicians • Environmental Scientists and Specialists • Geological Technicians • Hydrologists • Hydrologic Technicians
Grassland/Rangeland	• Agricultural Equipment Operators • Farmers, Ranchers, and Other Agricultural Managers
Cropland	• Farmworkers and Laborers, Crop, Nursery, and Greenhouse • Soil and Plant Scientists

NCS occupations have a wide range of median wages, from $40,000 to $170,000 (Appendix F: Workforce Assessment Supplementary Figures F). Many more-common NCS occupations, such as crop/nursery farmworkers, earn relatively low wages, while more-specialized and less common occupations tend to have the highest wages. Some occupations (mostly higher wage) have a wide distribution of wages while others (mostly lower wage) have narrow distributions.

While entry-level wage data are not readily available, 10th-percentile wages are a reasonable proxy (see Appendix F). Looking at 10th-percentile wages across regions of Oregon is also useful: for some occupations, there is a large difference between the wage in the region with the lowest 10-percentile wage and the wage in the region with the highest 10-percentile wage (e.g., environmental engineers). Most of the highest maximums are for positions in the Portland-Metro area, and most of the lowest minimums are in rural areas.

Compared to regional medians across Oregon, NCS occupation median wages are generally higher for architecture/engineering and life/physical/social science occupations, lower for grounds maintenance occupations, and a mix for farming and forestry occupations (see Appendix F). Farming and forestry jobs pay more than the regional median in more-rural areas and less in more-urban areas, reflecting variations in local industry composition, cost of living, and other regional economic factors. Workforce recruitment and retention are likely more difficult in places where key NCS occupations pay less than the regional median.

Figure 14: Regional Wage Differentials for Key NCS Occupations, Oregon, 2024



Data source: Oregon Wage Information, OED 2024. Note: Occupational group wages are the weighted average of the key occupations' median wages.

Workforce Demographics

The analyses in this section rely on data from the American Community Survey (ACS). ACS data are self-reported, which differs from the Oregon Employment Department data presented in earlier figures, which are employer-reported. Differences in reporting method, classification systems, and data collection processes all contribute to variation across these data sources.

What Are Key Demographic Attributes of The NCS Workforce?

i. NCS workers are a bit older than Oregon workers overall. The sizeable segment of the NCS workforce that is approaching retirement highlights the need for proactive workforce development efforts.
ii. Compared to Oregon's overall workforce, the NCS workforce has fewer female workers.
iii. Oregon's NCS workforce has a higher share of BIPOC workers than Oregon's workforce overall.
iv. Educational attainment varies greatly across NCS occupations.
v. In many NCS occupations there may be room for training pathways that lead to a different attainment level than has traditionally been required or common within the occupation.
vi. NCS industry workers overall have a median wage of about $42,000, which is 9 percent lower than the Oregon workforce overall.
vii. BIPOC workers earn slightly below the median income and white workers earn slightly above.
viii. Living wage estimates vary by county, as do wages, but many NCS workers across Oregon are likely experiencing affordability challenges.

NCS workers are a bit older than Oregon workers overall (see **Figure 15**). In most NCS occupations, most workers are age 30-54; exceptions include life/physical/social science technicians (most are younger) and geoscientists/hydrologists (most are older). Farmers, ranch managers, and firefighting supervisors also have large shares of workers age 55 and over.[11] In a few NCS industries — crop production, support for crops and forestry, and truck transportation — the share of workers age 55 and older has increased over the past decade. The sizeable segment of the NCS workforce that is approaching retirement highlights the need for proactive workforce development efforts.

[11] Note that the firefighting occupations highlighted throughout this section include all firefighters and firefighting supervisors, not just wildland firefighters or prescribed burn operators.

Figure 15: Worker Age Distribution for Key NCS Occupations, Oregon

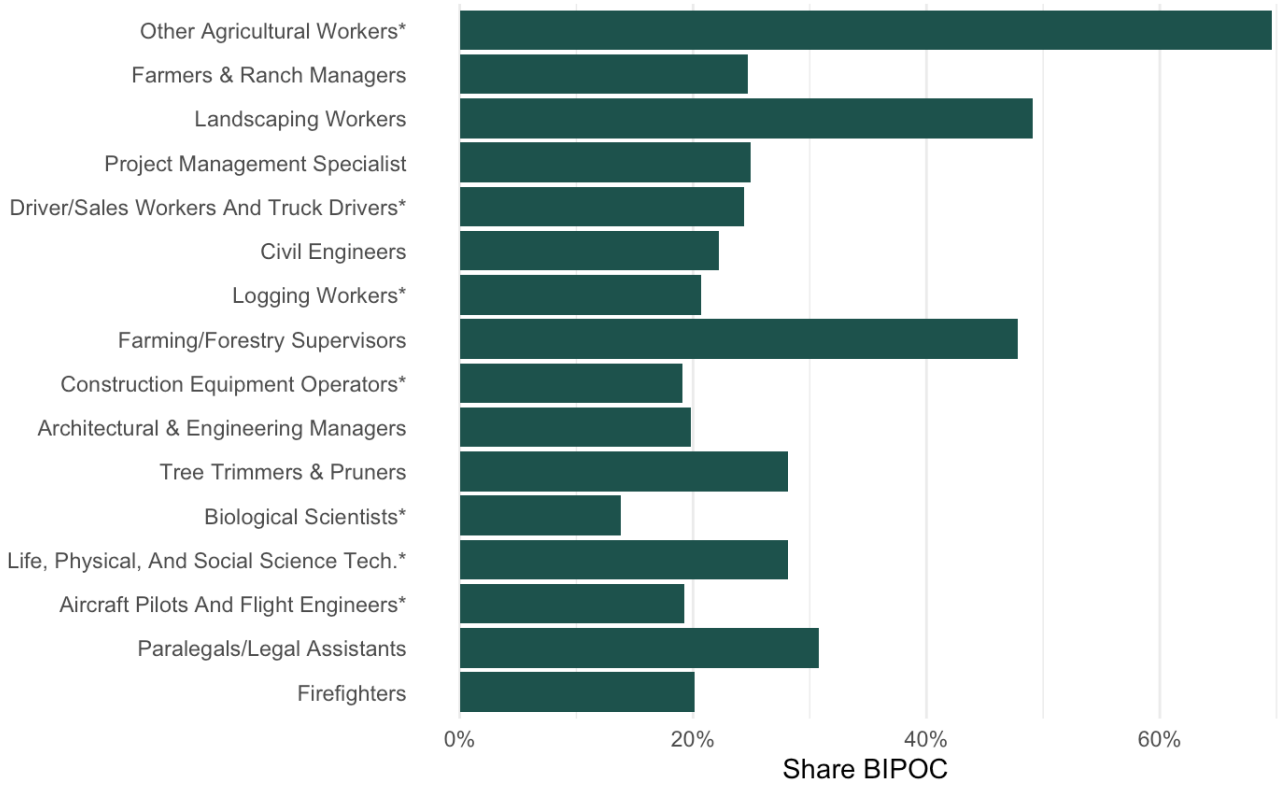
Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Notes: Occupations are ordered of number of employees in NCS industries (largest to smallest). Occupations with an asterisk (*) are those that have different formal titles in ACS data or are a combination of more than one occupation depicted in Figure 13.

Compared to Oregon's overall workforce, the NCS workforce has fewer female workers (see Appendix F). Oregon's NCS workforce is 22 percent female, compared to 50 percent for the overall workforce. Paralegals/legal assistants and life, physical, and social science technicians have comparatively high female representation (above 80 percent and 50 percent, respectively), while many field-based or manual occupations, such as logging workers, and survey and mapping technicians, have shares below 10 percent.

Oregon's NCS workforce has a higher share of BIPOC workers than Oregon's workforce overall (see **Figure 16**). The NCS workforce is 26 percent Hispanic or Latino and 9 percent non-Hispanic BIPOC, compared to 14 percent and 13 percent for the overall workforce, respectively. Hispanic/Latino workers are more represented among agricultural workers, farming/forestry supervisors, and landscaping workers, and less represented among aircraft pilots and flight engineers, architectural and engineering managers, and civil engineers. Non-Hispanic BIPOC workers are more represented among architectural and engineering managers, life/physical/social science technicians, and aircraft pilots and flight

engineers, and less represented among agricultural workers, construction equipment operators, and farming/forestry supervisors. Information about differences like these is useful for workforce development efforts around access to training/education and career pathways planning.

Figure 16: Share of Workers that are of Color, Key NCS Occupations, Oregon

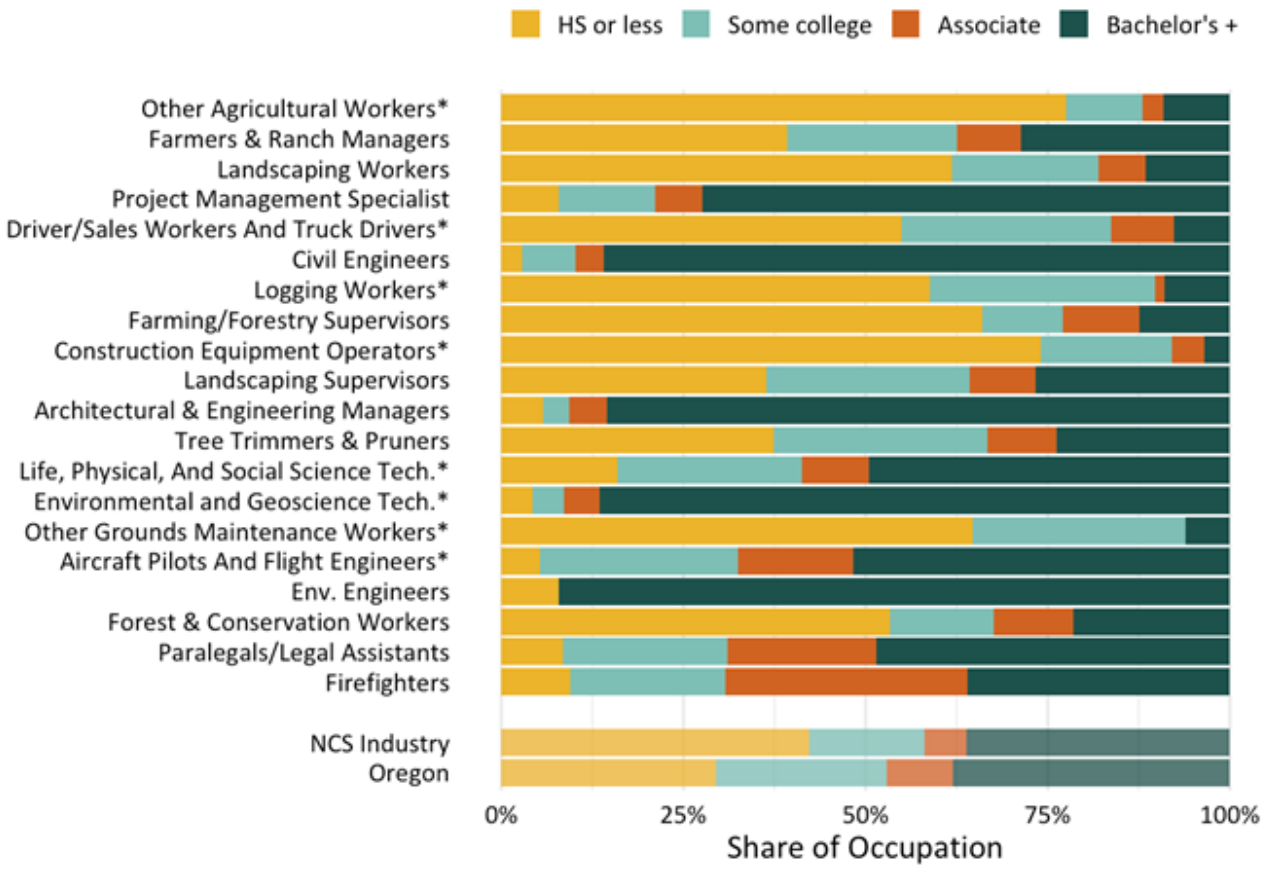


Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Notes: Occupations are ordered by number of employees in NCS industries (largest to smallest). Occupations with an asterisk (*) are those that have different formal titles in ACS data or are a combination of more than one occupation depicted in Figure 13. Many occupations cannot be disaggregated into detailed race and ethnicity categories due to sample size limitations. To display more occupations, non-Hispanic BIPOC and Hispanic or Latino workers are combined into a single BIPOC category.

Educational attainment varies across NCS occupations (see **Figure 17**). A larger share of NCS workers have a high school diploma or less as their highest attainment, compared to the overall Oregon workforce. Nearly half of NCS workers fall into this category, which is noticeably higher than the statewide average. At the same time, the share of NCS workers with a bachelor's degree or higher is only slightly below that of Oregon's overall labor force, reflecting the mix of both field-based and professional roles within the sector.

Occupations such as agricultural workers, landscaping workers, and construction equipment operators have higher shares of workers with a high school diploma or less as their highest attainment. In contrast, project management specialists, civil engineers, architectural and engineering managers, and environmental and geoscience technicians have high shares of workers with bachelor's degrees or above. Occupations such as landscaping supervisors and tree trimmers and pruners show a mix of educational backgrounds, with many workers reporting some college or an associate degree. In many NCS occupations there may be room for training pathways that lead to a different attainment level than has traditionally been required or common within the occupation.

Figure 17: Worker Educational Attainment in Key NCS Occupations, Oregon

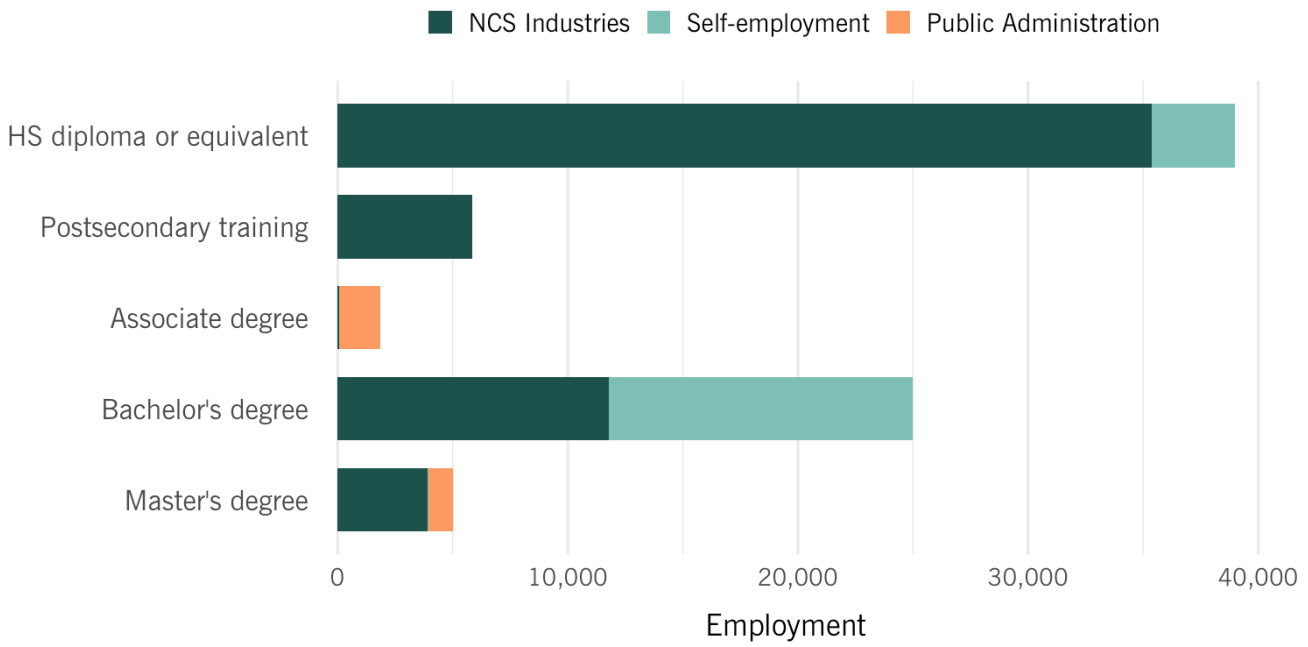


Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Notes: Occupations are ordered by number of employees in NCS industries (largest to smallest); not all occupations are available in the data. Those with an asterisk (*) are those that have different formal titles in ACS data or are a combination of more than one occupation depicted in Figure 13.

About half of workers in key NCS occupations are in positions for which the competitive education level is a high school diploma or equivalent (see **Figure 18**).[12] The next largest share of workers is in occupations where a bachelor's degree is considered the competitive level. This distribution of credentials suggests the importance of all types of NCS training and career pathways: high school CTE programs, postsecondary certificate programs, degree programs, workforce development programs, and on-the-job training.

[12] The competitive education level is defined by OED and identifies the educational requirements typically necessary for a job applicant to compete successfully for jobs that attract many potential employees.

Figure 18: NCS Occupational Employment, by Competitive Education Level



Data source: OED IO Matrix (2023). BLS National IO Matrix (2023). OED Oregon Occupational Projections, 2023. Notes: NCS Industries includes private and public employment; public administration employment is shown separately because subindustry detail is not available. Self and public administration employment are displayed for occupations for which such employment is likely NCS-related (identified in Figure 13).

Wage disparities can reveal how structural barriers, access to opportunities, and occupational segregation affect workers' economic outcomes. Highlighting these differences helps identify areas where targeted interventions can promote equity across industries.

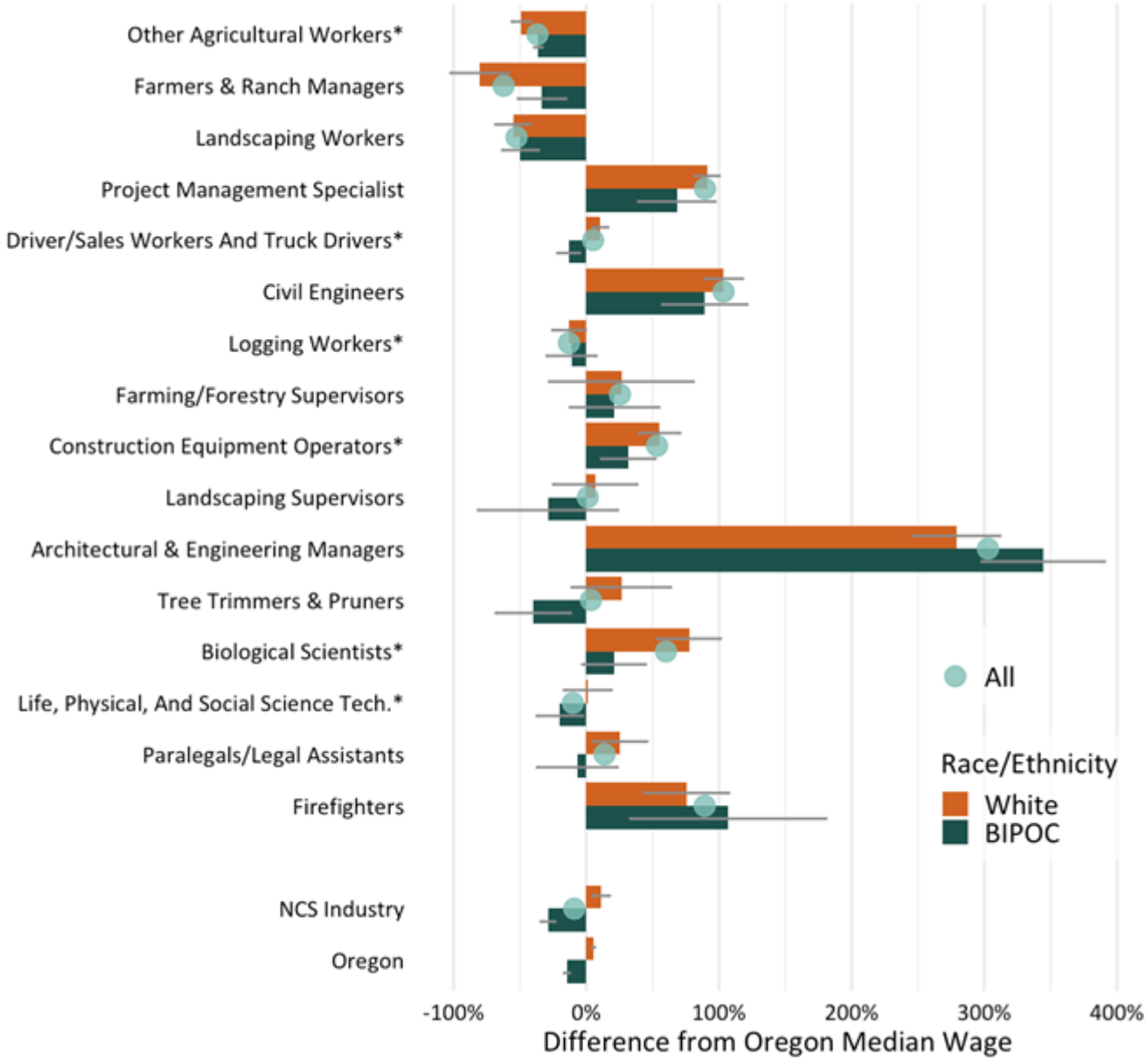
Across many key occupations, median wages for both white and BIPOC workers exceed the statewide median, though the size of this advantage varies considerably (see **Figure 19**). The largest positive wage differentials appear in higher-skilled roles such as architectural and engineering managers, civil engineers, and project management specialists, where both groups earn substantially more than the Oregon median. Within these higher-wage occupations, differences between racial groups persist, with BIPOC workers often earning slightly less than white workers. Agricultural, landscaping, and logging workers earn near or below the state median income.

NCS industry workers overall have a median wage of about $42,000, which is 9 percent lower than the Oregon workforce overall. BIPOC workers earn slightly below the median wage and white workers earn slightly above. While these estimates do not account for all types of income, nor total household income, they can be compared to MIT's Living Wage estimates for Oregon for context.[13] A single adult without children requires $52,300 annually to meet a basic standard of living in the state, while a single adult with two children requires $120,000. Living wage estimates vary by county, as do wages, but many NCS workers across Oregon are likely experiencing affordability challenges. NCS workforce development

[13] Massachusetts Institute of Technology Accessibility. "Living Wage Calculation for Oregon." https://livingwage.mit.edu/states/41

efforts should consider affordability-related equity and retention challenges the workforce may face over the long term.

Figure 19: Race/Ethnicity Wage Differentials for Key NCS Occupations, Oregon

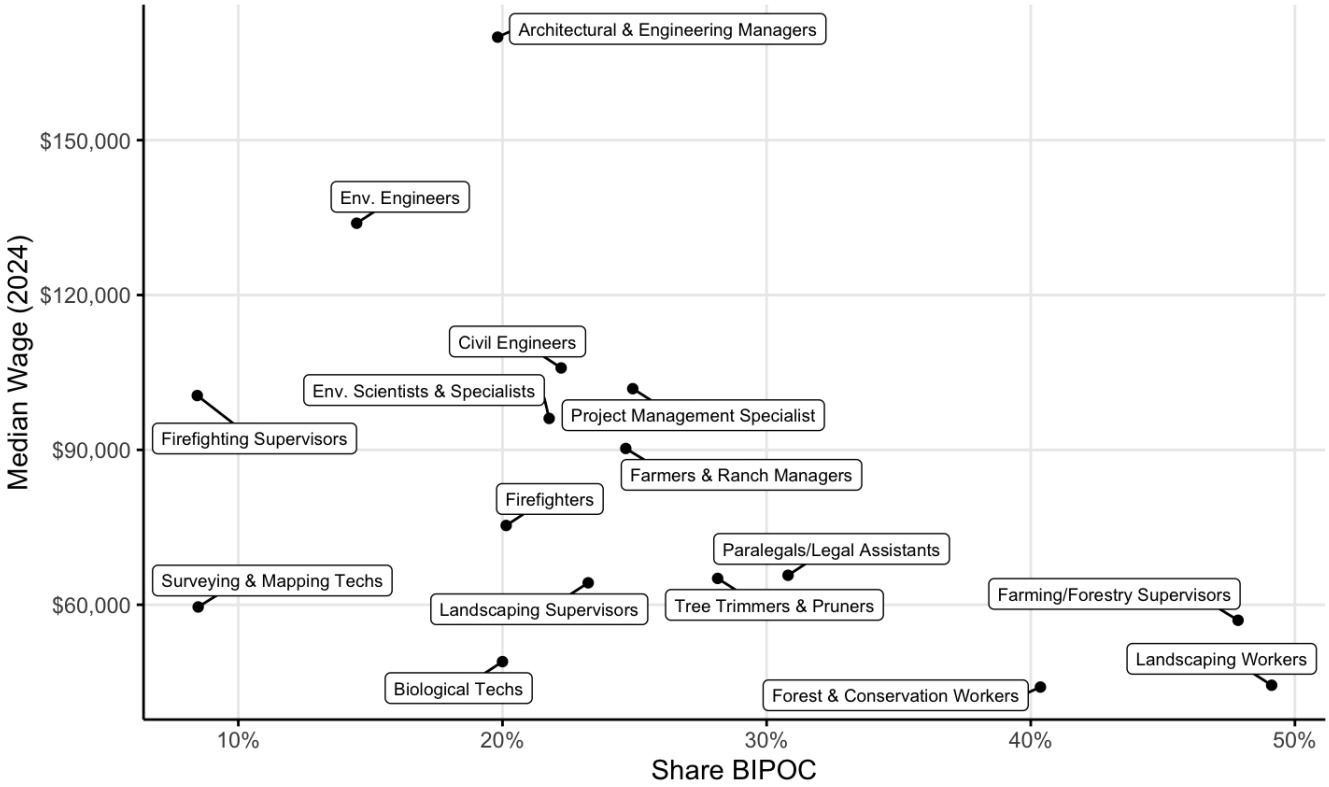


Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Notes: Occupations are ordered by number of employees in NCS industries (largest to smallest); not all occupations are available in the data. Those with an asterisk (*) are those that have different formal titles in ACS data or are a combination of more than one occupation depicted in Figure 13. Each bar reflects how the median wage for that group differs from the Oregon median wage.

Occupations with higher shares of BIPOC workers generally appear on the lower end of the wage distribution, while occupations with smaller BIPOC shares tend to fall within higher wage ranges (see **Figure 20**). Field-based roles such as landscaping workers, farming and forestry supervisors, and forest and conservation workers show some of the highest levels of BIPOC representation, around 30 to 50 percent, and annual median wages between $50,000 and $70,000.

Occupations that require more technical training or professional credentials, including environmental engineers, civil engineers, and architectural and engineering managers, have annual median wages ranging from $110,000 to more than $150,000, with BIPOC representation typically below 20 percent. Mid-wage occupations such as project management specialists and firefighters fall between these two groups both in terms of earnings and BIPOC share.

Figure 20: Median Wage by Share of NCS Occupation's Workers that are BIPOC, Oregon



Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Oregon Wage Information, OED 2024.

Women are represented across NCS occupations, although the occupations where they have the highest representation tend to fall on the lower end of the median wage distribution (see Appendix F). Female representation is highest in administrative and technical support roles such as paralegals and legal assistants and biological technicians, and these occupations have annual median wages below $75,000.

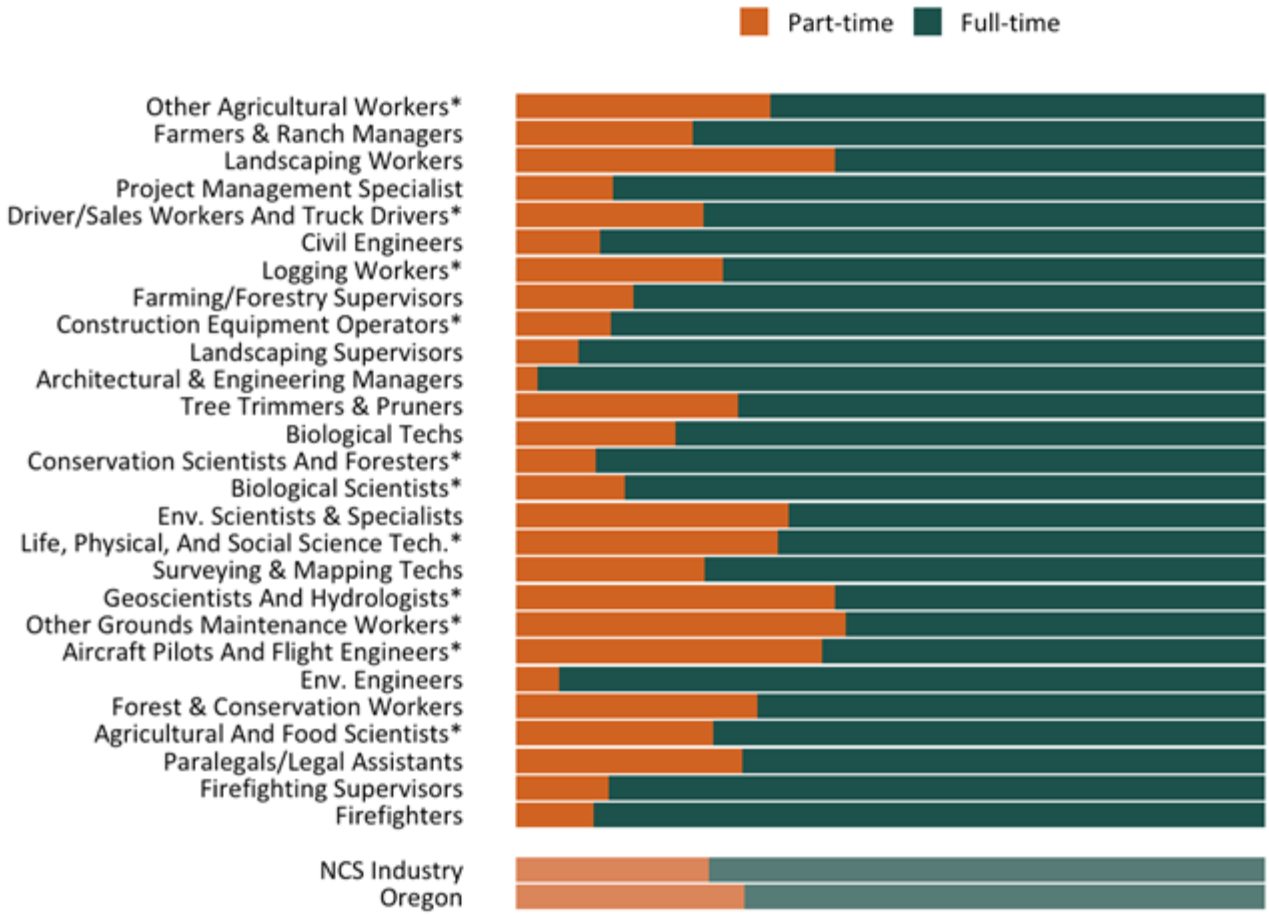
Managerial, engineering, and other high-skill technical occupations have much lower shares of female workers. Architectural and engineering managers, environmental engineers, and civil engineers all have annual median wages above $110,000 and female representation below 25 percent.

There is significant variation in work hours across the NCS occupational landscape, and the prevalence of part-time work depends heavily on the type of role (see **Figure 21**). Most workers in key NCS occupations are employed full-time. However, the share of part-time employment differs widely by occupation.

Part-time work is most common among landscaping workers, grounds maintenance workers; and geoscientist and hydrologists. In contrast, many professional, technical, and emergency response roles have mostly full-time employment. Occupations such as architectural and engineering managers,

environmental engineers, and landscaping supervisors show very small shares of part-time workers. The prevalence of part-time work depends heavily on the type of role.

Figure 21: Part- and Full-time Employment Status for Workers in Key NCS Occupations, Oregon



Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Notes: Occupations are ordered by number of employees in NCS industries (largest to smallest). Occupations with an asterisk (*) are those that have different formal titles in ACS data or are a combination of more than one occupation depicted in Figure 13. Full-time employment is full-year, greater than or equal to 35 hours per week.

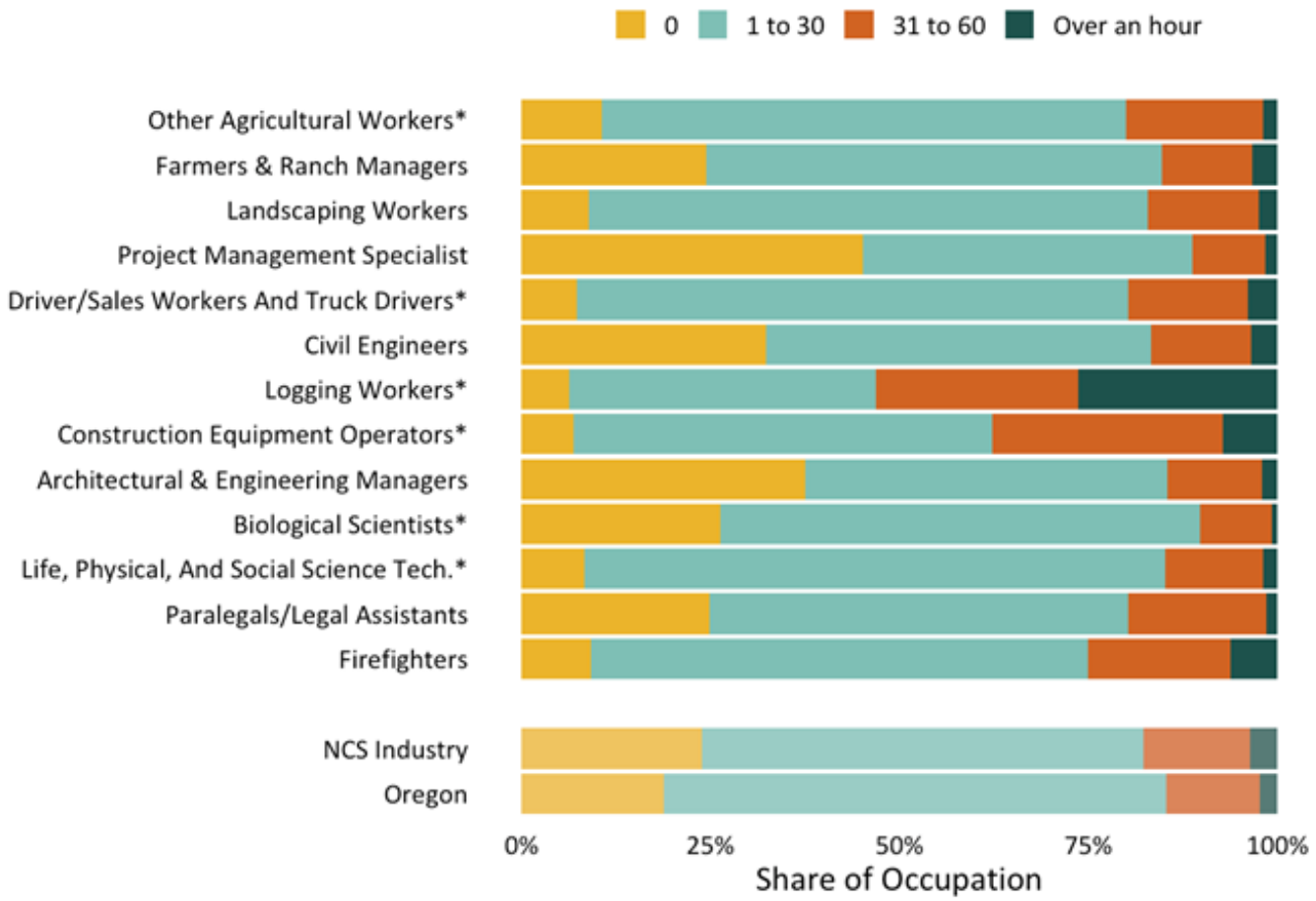
Commute times also vary across NCS occupations, but most NCS workers travel less than 30 minutes to work, which is similar to the statewide average (see **Figure 22**). However, workers in several NCS roles, particularly those that are more likely to be in rural or remote areas, report longer commute times, including commutes of 31 to 60 minutes and, in some cases, over an hour.

Logging workers, construction equipment operators, and firefighters have some of the longest commute patterns. At least 30 minutes of travel is common for these groups, and about a quarter of logging workers report commute times of over an hour. In contrast, occupations such as project management specialists and biological scientists have shorter typical commute times, with many workers traveling under 30 minutes.

Commute time data reflect the trip “from home to work,” and respondents likely do not report the total time spent traveling to job sites, for example, workers who report first to a central office, headquarters,

or duty station and then travel farther to a field location or project site. This additional travel is a meaningful consideration for understanding the true time and logistical burden associated with NCS fieldwork.

Figure 22: Average Commute Times (Minutes) for Workers in Key NCS Occupations, Oregon



Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Notes: Occupations are ordered by number of employees in NCS industries (largest to smallest); not all occupations are available in the data. Those with an asterisk (*) are those that have different formal titles in ACS data or are a combination of more than one occupation depicted in Figure 13.

NCS WORKFORCE NEEDS FINDINGS

Built upon the workforce evaluation and assessment; through project team engagement with working groups; and conducting detailed interviews with workforce partners, Tribal partners, and Tribal Nations, the Study identifies challenges, needs, and gaps that may affect the ability of this workforce to meet Oregon's climate goals.

This section is organized into two sub-sections that correspond with the two drivers of workforce trends, workforce demand and workforce supply.

Workforce Demand Findings

Funding and Procurement

Funding and Procurement Barriers and Gaps

1.	2.	3.	4.	5.
Low-bid procurement practices, driven by rigid rules and limited funding structures, create a race to the bottom among NCS contractors.	Gaps in maintenance funding inhibit year-round employment for contractor field crews and weaken carbon sequestration outcomes.	Shifting federal priorities have made it difficult for agencies and contractors to continue their NCS projects and plan for growth.	Grant funding does not allow the flexibility needed for organizations to adequately cover NCS project costs.	Few public incentives exist for businesses and land managers to learn about and implement NCS.

1. **Low-bid procurement practices, driven by rigid rules and limited funding structures, create a race to the bottom among NCS contractors.** These contracting practices do not account for the full cost of NCS jobs and undermine long-term ecological outcomes.

    Regardless of industry, low-bid contracts drive down wages and job quality. This structure is especially prevalent in federal forestry contracts, which govern much of the work on natural and working lands in Oregon. Restoration contractors shared frustrations that standard contracts from public and private land management sources do not grant them enough flexibility and financial capacity to make the job quality improvements that this study suggests.

    Further, interviewees noted that forestry contracts tend to be no longer than one year in length. This requires contractors to rebid year after year, which puts an ongoing administrative burden on the businesses. "If I was a defense contractor," one interviewee noted, "I would be on a multi-year contract."

    Contractors also shared that state-funded projects do not cover the full cost of project management that is necessary for the successful implementation of NCS strategies. Funders may require that a contractor bill for project management services at a lower laborer rate, which undercompensates the business and weakens the advancement pipeline for crew members that might hope to move up into project manager roles. Contractors often lose project managers to better-paid agency jobs because of inadequate funding for NCS project management labor.

Interviewees said that in-house project management is essential to the success of NCS and long-term outcomes but is perceived by state funding agencies as redundant and unnecessary.

Apart from misclassified pay tiers, some restoration labor is not paid. Some state contracts allow the use of volunteer labor in restoration work, and many land management nonprofits, such as land trusts, rely on volunteer labor. While this is a way to expose new workers to the industry, normalized volunteer labor becomes an avenue for bidders to cut costs on project bids and undercuts sustained employment in the sector.

2. **Gaps in maintenance funding inhibit year-round employment for contractor field crews and weaken carbon sequestration outcomes.**

   Funding opportunities prioritize NCS planning and implementation phases of projects. Additional funding for maintenance work that can be performed year-round would open opportunities for contractors to improve job quality by keeping crews employed. Contractor-led maintenance, monitoring, and stewardship activities are important to ensure the long-term success of NCS projects.

3. **Shifting federal priorities have made it difficult for agencies and contractors to continue their NCS projects and plan for growth.** Restoration contractors face uncertainty in their business planning and operations due to fluctuations in state and federal funding.

   With high equipment capital costs, restoration contractors rely on committed funding to take on and pay off debt. Contractors seek more certainty in future work opportunities before they commit to additional capital investments and hiring. Funding uncertainty hinders their ability to support these capital expenditures and discourages contractors from hiring additional employees.

   Among agency impacts, Soil and Water Conservation Districts (SWCD) report recently losing significant federal funding. This loss of funding halted several “shovel ready” projects, including wildfire mitigation projects in forests and rangelands, leaving SWCDs and land managers scrambling to find new sources of funding. SWCDs are also a critical resource for farmers who want to implement NCS strategies. Farmers may find it harder to obtain expertise from SWCD staff as agency funding resources decrease.

   Shifting federal policy is also impacting demand for NCS work. The U.S. Supreme Court decision *Sackett v. EPA* significantly narrowed the definition of “waters of the United States” under the Clean Water Act, which may negatively affect the future demand and scale of wetland restoration work. While Oregon has its own state wetlands law that should continue to drive demand for wetland NCS, the impact of the EPA’s modification to its regulation is still unknown.

4. **Grant funding does not allow the flexibility or capacity needed for organizations to adequately cover NCS project costs.** Because grants are the primary funding source for NCS work, many organizations struggle to meet grant administration requirements. Short grant terms, eligible expense limitations, and overall administrative burden pose significant barriers in the grant-reliant NCS ecosystem.

   Grant terms are restricting factors for many NCS organizations and workforce programs. Typical grant terms of up to one year make long-term workforce planning a challenge for Tribal Nations, nonprofits, schools, and other training providers. These organizations need reliable funding to sustain programs that have meaningful employment impacts on the communities they serve.

Tribal Nations face particularly restrictive barriers in their heavy reliance on grant funding. One Tribe shared that they manage 29 separate grants out of a single office. A grant portfolio of this size requires significant administration, pointing to the need for consolidation. Further, the inflexible nature of grant funding makes it challenging to accommodate Tribal workforce service needs. For example, state workforce development partnerships with Tribal Nations do not consider access to childcare and transportation, two supportive services critical for workers, in funding allocations.

The administrative burden of grant funding has acutely affected SWCDs. While both types of SWCDs in Oregon (those with and without tax bases) note financial constraints that impact their workforce, tax-base SWCDs have more financial stability, and grant-reliant districts must continually secure new funding to sustain operations and hire staff. The grant ecosystem severely limits how much SWCD staff can be compensated. These constraints predate recent federal funding changes, which have only aggravated the challenges.

5. **Few public incentives exist for businesses and land managers to learn about and implement NCS.** Agricultural producers, including farmers and ranchers, need strong incentives to pursue soil health strategies.

   Private land managers of forests, wetlands, and working lands need market incentives to make NCS financially viable. Interviewees emphasized that widespread adoption will not occur among private landowners without economic motivation, as well as technical assistance and education about the economic benefits of soil health.

   Producers without land tenure (either through ownership or long-term leases) lack incentive to implement NCS on their land because these strategies can take several seasons to implement and provide benefits.

   Producers need additional outreach and education to understand the economic benefits of NCS. SWCDs are connective service providers that can help producers plan, fund, and implement NCS. Interviewees note many producers may be simply under informed about the financial benefits of implementing soil health practices on their land. Soil health practices can promote economic resilience, increased productivity, reduced input cost, and marketing advantages, which can result in greater profitability.

   Forest managers and producers who are interested in implementing NCS face other threats to operations like rising insurance costs and shrinking coverage. Without sizable changes to the insurance marketplace, some land managers expect they will have to cut back on operations. One forester framed the insurance crisis as an immediate threat to staying in business – and to keeping his staff employed.

Funding and Procurement Areas of opportunity & improvement

6.	7.
The state has used contract levers in other industries, such as transportation and construction, to ensure public funds strengthen workforce standards.	The state could look to practices by other public entities that help small and minority-owned businesses secure contracts with local, regional, and state agencies.

6. **The state has used contract levers in other industries, such as transportation and construction, to ensure public funds strengthen workforce standards.**

   Tools such as Project Labor Agreement (PLA) and Community Workforce Agreement (CWA) requirements on restoration contracts can ensure public NCS dollars support contractors who utilize apprentices, prioritize local workers, and develop career pathways.

   One interviewee pointed to Oregon House Bill 2021's Responsible Labor Standards as an example for how to improve job quality on state-funded NCS projects. The standards include minimum apprentice work hours and goals for diverse hiring of women, minority individuals, veterans, and people with disabilities, among other job quality standards.[14]

7. **The state could look to practices by other public entities that help small and minority-owned businesses secure contracts with local, regional, and state agencies.**

   Agencies throughout Oregon already excel in contracting with small and minority-owned businesses. There is an opportunity to scale best practices from existing programs on a statewide level. For example, Oregon Metro has developed a variety of materials and outreach events intended to educate contractors on how to successfully bid on projects.

[14] https://www.oregon.gov/energy/energy-oregon/Pages/LSEP-Labor-Standards.aspx

Workforce Supply Findings

Recruitment

These findings relate to the identification, sourcing, and screening of candidates for NCS occupations. They concern the range of workforce development, training, and other supports that will help workers find jobs that meet the needs of the NCS sector.

Recruitment Barriers and Gaps

8.	9.	10.	11.	12.	13.
Pay and training disparities between urban and rural areas affect employers' ability to attract employees to rural regions of the state.	Demand remains high for restoration work in rural areas.	Limited access to and the high cost of housing, childcare, transportation, and education hinders workers from securing training and employment.	Entry-level NCS jobseekers lack the basic technical skills that employers demand.	Farm work generally offers low pay and benefits.	Seasonal work and physically demanding tasks make it difficult for contractors to secure long-term workers.

8. **Pay and training disparities between urban and rural areas affect employers' ability to attract employees to rural regions of the state.**

   Regional pay disparities exist among NCS planning, implementation, and maintenance entities in Oregon. For example, interviewees shared that land trusts, SWCDs, and nonprofits in the Northwest and Willamette Valley pay more than those in rural regions of the state. This study's workforce assessment found that the lowest minimum tenth-percentile wages across NCS occupations were found in rural regions of Oregon (see Appendix F).

   Further, rural areas have a smaller local pool of qualified candidates for NCS planning roles due to limited training and educational resources in these regions. Rural employers note that biologists, wetland scientists, and foresters are more likely to move to urban areas to advance in their careers after a year or two of rural service. Because rural professional positions are harder to fill, some NCS planning agencies like SWCDs have opted to relax their degree requirement for rural-area project management and conservation planner jobs. One rural SWCD has recruited successful candidates by recognizing lived experience in ranching or farming in place of a college degree.

   Limited career opportunities are a major contributor to people leaving rural areas, especially for young adults who leave for education and training opportunities. Some rural regions do not have their own NCS workforce pools and must recruit permanent and temporary workers from Portland or other urban areas to fulfill NCS workforce needs. This can make it hard to fill positions, particularly if relocation or other fringe benefits cannot be offered.

9. **Demand remains high for restoration work in rural areas.**

   Despite these trends, rural areas have an unmet demand for restoration contractors because of the limited geographic distribution of firms. In some cases, land managers must implement NCS themselves without the expertise of trained work crews. In others, NCS go unimplemented, despite interest and resource availability. This gap in contractor capacity will be exacerbated with the impending climate-related changes to Oregon's natural areas and the imminent need to clear ash trees due to the invasive emerald ash borer.

10. **Limited access to and the high cost of housing, childcare, transportation, and education hinders workers from securing training and employment.**

    According to several interviewees, entry-level NCS jobs across Oregon do not pay enough to meet rising housing costs in high cost-of-living areas. Housing availability and affordability in rural, coastal, and urban jurisdictions continue to be significant barriers for workers in the N&WL sector. For rural and coastal areas, lack of housing near project sites and associated long commute times pose compounding barriers for these workers. These factors also create high mobilization costs for land managers who must transport work crews to project sites.

    Access to high-quality and affordable childcare is a major barrier for participation in training programs and job retention across the state, especially in rural regions. Childcare access is challenging due to limited supply (i.e., "childcare deserts"), long waitlists, and limited childcare staffing. Lack of childcare access is a growing concern for young parents in training programs. Workforce leaders in Eastern Oregon shared that a scarcity of childcare centers and insufficient after-school programming cause formidable challenges for working parents.

    NCS jobs often require workers to arrange personal transportation to project sites across long distances. Limited access to driver's education and a personal vehicle hinders some job seekers' ability to enter these careers. As a result, training programs surveyed in this study provide group transportation for field crew trainees to project sites.

    While some employers will consider field experience in lieu of formal education, two- and four-year degrees remain common prerequisites to NCS planning and project management roles. Some workers who would be successful in NCS careers may not have the time or resources to complete a degree program. Workforce boards characterize education requirements as discouraging but surmountable barriers through alternative pathways and education supports.

    These issues are especially prevalent in rural and Tribal communities and often exasperated by the lasting effects of historical disenfranchisement. Adding to driver's education barriers, these communities often have limited access to Department of Motor Vehicles (DMV) appointments and public transit. To address these challenges, some Tribal Nations drive youth jobseekers long distances to obtain these basic public services. Interviewees also noted the stigma of food insecurity and poverty as ongoing challenges, as job seekers fear judgement and discrimination in the hiring process.

11. **Entry-level NCS jobseekers lack the basic technical skills that employers demand.** Despite education requirements, entry-level conservation technicians, natural resource scientists, and project managers typically learn basic industry skills on the job.

    Workers with technical skills like plant identification, soil science, engineering, and machinery operation are in demand among NCS planning agencies, firms, and land management nonprofits.

Some contractors noted that recent college graduates may have theoretical knowledge of these concepts but lack practical experience. These workers end up learning these practices on the job. In addition to field skills, desk-based project management skills such as budgeting, grant-writing, and contract compliance are critical for planning and project management roles, but many college graduates lack these skills.

In positions that do not require a college degree, certifications are sometimes necessary for entry-level staff, but training resources are not always accessible. For example, young people lack essential certifications like commercial driver's licenses for heavy-duty vehicle operation careers that support NCS.

12. **Farm work generally offers low pay and benefits**. Due to low wages, 32 percent of farmworker households in Oregon and Washington are in poverty.[15] Farm jobs are in high demand in rural Oregon and are often filled by immigrant workers with temporary visas or without documentation.

    In addition to the wage data presented in this Study, a 2023 farmworker housing study by the Oregon Housing and Community Services Department (OHCS) demonstrated that farm jobs make up the lower spectrum of wages, benefits, and working conditions. The OHCS study recommends solutions such as expanding Section 8 voucher requirements and increasing housing types (including low-income rental housing and community-based farmworker housing, among others). Farmworkers also face seasonal precarity, prevalent contract employment practices, and poor access to safe and affordable housing, healthcare, and childcare. While some farm employers and counties, such as Hood River and Wasco, are leading the way by developing housing that farmworkers can afford, the persistent need for farmworker housing creates ongoing challenges like overcrowding, high costs, and entrenched poverty.[16]

    This labor force is especially vulnerable to the recent Federal immigration actions. Interviewees noted that federal policy changes may result in farm owners taking on more of the farm work themselves as immigrant labor decreases.

13. **Seasonal work and physically demanding tasks make it difficult for contractors to secure long-term workers.** The seasonal aspect of many NCS occupations presents many obstacles to permanent, year-round employment.

    Most significantly, the lack of work in the off seasons makes it difficult for workers to stay in work-crew jobs due to the lack of a consistent income. Because of this, NCS crew work does not support long-term career trajectories for entry-level jobseekers.

    Firefighting can keep restoration work crews employed for longer periods of time. During fire season, some restoration crews move to more lucrative firefighting jobs to fill gaps during the off-season. Seasonal firefighting ranks are usually filled with non-local workers. Some contractors will also take on forestry projects for a season and move to firefighting the next.

    Restoration jobs involve hazardous and physically demanding tasks in outdoor environments. [17] Due to discomfort and the threat of injury, it is challenging for restoration contractors to find

[15] OHCS Agricultural Worker Housing Study 2022_FNL-3/23_ENG copy
[16] OHCS Agricultural Worker Housing Study 2022_FNL-3/23_ENG copy
[17] Wilmsen C, Bush D, Barton-Antonio D. Working in the Shadows: Safety and Health in Forestry Services in Southern Oregon. J For. 2015 May;113(3):315-324. doi: 10.5849/jof.13-076. Epub 2015 Mar 12. PMID: 29643572; PMCID: PMC5890815.

consistent labor, so they are often willing to train on the job if a worker proves reliable. In many cases "showing up on time" or "working well with others" can be more important than hard skills during the hiring process.

Recruitment Areas of opportunity & improvement

14.	15.	16.	17.
NCS work is appealing to young workers.	Workforce demographics are shifting toward increased generational, gender, and racial diversity.	Subsidized training programs help entry-level workers overcome barriers.	Restoration work and natural resource careers offer potential pathways for formerly incarcerated individuals reentering the workforce.

14. **NCS work is appealing to young workers.**

Young people are attracted to the purpose-driven and hands-on nature of the work, which many as an exciting "job of the future." One interviewee from a rural high school in Southern Oregon shared that their school does not have sufficient funding to keep up with growing interest in a paid summer field crew program. This interest represents enormous potential for developing pathways for rural high school students and opportunity youth (young people between the ages of 16 and 24 who are neither enrolled in school nor participating in the labor market). Programs with early career exposure are also very popular. Wildland firefighting and fuel mitigation jobs are of particular interest to rural youth because of personal experiences with wildfires and proximity to impacted areas that need work.

This presents an opportunity for work on land types that have an aging workforce, such as croplands and forests. Workforce agency partners suggested that as soil health concerns grow and NCS farm methods develop, reframing agriculture careers as NCS work could drum up excitement for jobs on working lands. This can help drive young people into agriculture careers and farm ownership. The sizable segment of the NCS workforce that is approaching retirement highlights the need for proactive workforce development efforts to engage and retain young workers in the sector.

There is anecdotal evidence that NCS programs for youth and young adults can support career pathways into the military, building trades, and post-secondary education, although tracking long-term outcomes is challenging. According to interviewed training program leaders, graduates tend to transition into wildland firefighting, trail work, or government natural resource roles.

15. **Workforce demographics are shifting toward increased generational, gender, and racial diversity.**

Women, non-binary workers, and people of color are underrepresented in the industry but gaining ground in some organizations. SWCD managers are increasingly women workers, and one contractor's field crew workforce boasted a majority of women and non-binary members. The contractor found success in customized and adjustable equipment and work conditions to accommodate diverse workers, such as custom-length shovels, noting that "a lot of tools and equipment [are] forestry equipment designed for six-foot-five mountain men, which is not what our workforce looks like. If you give people the right equipment, anyone can do this work."

Successful internship and apprenticeship programs that focus on BIPOC youth are diversifying the industry. These include statewide programs like Oregon Conservation Corps and individual organization programs like the Oregon Natural Desert Association Tribal Stewards Program, among others.

16. **Subsidized training programs help entry-level workers overcome barriers.**

    Paid internships, earn-while-you-learn apprenticeships, and mentorship programs are essential for building skills and retaining workers. For young workers, early exposure to conservation work helps build interest and pathways for future employment. Programs like Oregon Youth Corps and Tribal youth initiatives provide career exposure and soft skill development opportunities across the state.

    In addition, these programs' on-the-job training approach provides a pathway for advancement that does not require a college degree. Programs that offer subsidies and other supportive services offer models for growing new trainings in Oregon. State partnerships with rural community and technical colleges, Tribal colleges, and K-12 Career Technical Education (CTE) programs have helped address skill gaps.

    These programs can provide micro-credentialing and certifications that boost NCS career prospects for workers across occupations. In-demand credentials include plant identification training, commercial driver's licenses and driving skills, pesticide applicator licenses, first aid/CPR training, and geospatial information systems (GIS) competencies. The exact skills vary by occupation, but many interviewees raised these as beneficial for NCS work across occupations and land types.

17. **Restoration work and natural resource careers offer potential pathways for formerly incarcerated individuals reentering the workforce.**

    Interviewees suggested that people who have been affected by the justice system encounter fewer barriers in restoration and natural resource careers than they might elsewhere. The prevalence of on-the-job training makes contract labor an appropriate entry point for this workforce. In recognition of this potential pathway, Eastern Oregon Workforce Board is developing re-entry services for people interested in entering forestry and construction careers upon release from prison.

    Employers should also recognize experience earned in Department of Corrections and Oregon Department of Forestry affiliated trainings for wildland firefighting and habitat restoration, like those that exist at Coffee Creek Correctional Facility Prison and Deer Ridge Correctional Institution.

Training

These findings address the competencies and skills that are relevant to successful NCS implementation and the ecosystem that trains entrants and incumbent workers in NCS methods.

Training Barriers and Gaps

18.	19.	20.	21.	22.
Technical assistance providers are key to NCS implementation on working lands, but they require up-skilling to stay up to date on the newest strategies and to effectively engage with producers.	In restoration, unpaid work is an industry norm to gain the first one to two years of field experience necessary for entry-level project management and NCS planner positions.	Project managers have a highly transferable skillset but need to have a broad understanding of the field to be successful. This requires exposure to many project types.	Field crew laborers have poor access to credentials that certify their skills.	Programs targeting youth for employment in NCS are essential for long-term workforce development, yet many youth face barriers to accessing them.

18. **Technical Assistance providers are key to NCS implementation on working lands, but they require up-skilling to stay up to date on the newest strategies and to effectively engage with producers.**

    Interviewees noted that not enough SWCD staff have NCS expertise. Providers need continuing education to understand new NCS methods and to effectively encourage producers to adopt them.

    Some farm and forest service providers lack the language skills and cultural fluency needed to work with forest managers and producers from underrepresented groups. These producers report that their needs are not always met or understood when working with these providers.

19. **In restoration, unpaid work is an industry norm to gain the first one to two years of field experience necessary for entry-level project management and NCS planner positions.**

    Restoration occupations that plan and manage NCS implementation require around two years of field experience. Applicants sometimes meet this requirement through paid field crew experiences, but many successful applicants satisfy this requirement through volunteer work and unpaid internships. Unpaid work is a significant barrier for low-income job seekers who cannot forgo paid employment to gain necessary field skills.

    Project management and planner positions also typically require a bachelor's degree, which disadvantages jobseekers who have practical knowledge of NCS but lack a formal degree. Nonetheless, employers indicated that two- and four-year degree programs do not provide the requisite field experience needed for entry-level positions, so employers expect graduates to gain field experience as well. The failure of degree programs to deliver in-demand field skills leads students to rely on unpaid work to round out their resume.

20. **Project managers have a highly transferable skillset but need to have a broad understanding of the field to be successful. This requires exposure to many project types.**

    Early career project managers need exposure to diverse project types. Project managers at agencies, land management nonprofits, and restoration firms can gain broad knowledge of the field without needing to be subject matter experts. For example, a project manager at a restoration firm can benefit from understanding permitting, local environmental regulation, budgeting, and more, equipping them with the experience to guide a project effectively.

    Workers can also leverage project management experience in other sectors, such as construction. As NCS projects have increased, schools like Oregon Institute of Technology in Klamath Falls, have launched modules on natural areas in their construction project management curricula.

21. **Field crew laborers have poor access to credentials that certify their skills.**

    There are minimal certifications available to members of work crews across land types. Stronger credentialing would help develop a workforce that is prepared to properly implement NCS. While CPR and pesticide/herbicide spraying licenses are standard, essential skills for successful NCS implementation like jobsite safety, equipment operations, and plant identification are informally trained on the job and seldom certified.

22. **Programs targeting youth for employment in NCS are essential for long-term workforce development, yet many youth face barriers to accessing them.**

    Youth and young adults are interested in NCS jobs and increasing youth employment is a priority for Tribal Nations. Young people make up a considerable portion of the Tribal population and Tribal youth tend to live in rural parts of the state where restoration work is needed.

    These youth face particular barriers in accessing NCS training programs. High costs for gear, transportation, and education create obstacles. Youth training programs highlight the need for jobsite-appropriate clothing and boots that can be cost prohibitive, and high school programs must provide meals for students who face food insecurity at home.

    Public sector employment in NCS, especially federal and state jobs, often offer higher wages, health benefits, and financial stability in rural regions, but the application processes for these jobs (e.g., at USFS, NRCS, or BLM) are complex and intimidating to many jobseekers. Workforce development partners shared that qualified candidates need extensive support just to navigate the federal application process. Similarly, opportunity youth (young people between the ages of 16 and 24 who are neither enrolled in school nor participating in the labor market) who may succeed in college are impeded by limited understanding of college funding processes like FAFSA. College degrees are a common requirement for higher-level NCS positions, meaning that workers without formal education have limited advancement opportunities.

Training Areas of opportunity & improvement

23.	24.	25.	26.
Some public sector recruitment processes give priority consideration to graduates of accredited conservation programs.	Field crew jobs have low barriers to entry, making them good starting points for NCS careers.	Some contractors have institutionalized internal skill-based pay structures, which help workers up-skill in their current roles.	New NCS-related certifications are in development.

23. **Some public sector recruitment processes give priority consideration to graduates of accredited conservation programs.**

    This type of coordinated advancement gives jobseekers a leg up in the hiring process. For example, the Federal Pathways Program offers hiring advantages for Youth Conservation Corps graduates. A Public Land Corps certification, which represents 640 service hours, counts as the equivalent of two years of experience, providing a head start for applicants seeking permanent positions in the public sector.

24. **Field crew jobs have low barriers to entry, making them good starting points for NCS careers.**

    Field crew jobs are largely accessible because they have minimal education requirements and emphasize on-the-job training. Training and mentorship are prevalent, but additional training is needed to support advancement to higher quality jobs like foreman, project manager, or conservation technician.

25. **Some contractors have institutionalized internal skill-based pay structures, which help workers up-skill in their current roles.**

    One interviewed contractor shared that field crew members can train and obtain in-house certifications in skills like chainsaw operation and plant identification. Employees receive tiered pay increases based on their self-driven completion of these certifications. Field crew employers like this one can map newly formalized certifications onto their existing training and mentorship structures.

    Restoration contractors sometimes cross-train their crews with skills that expand the project capabilities of the firm. For example, restoration crews may be cross-trained as wildland firefighters, which opens additional career opportunities during the off-season.

26. **New NCS-related certifications are in development.**

    The emerging programs will produce highly qualified workers, and certifications will help jobseekers demonstrate their skills and advance their careers. Examples of these programs include a forest technician certificate and apprenticeship through Lomakatsi and a wetland delineation certificate available at Oregon State University (OSU) and community colleges. Additional certification programs offer alternative pathways into NCS careers for workers that do not have college degrees.

Retention and Advancement

These findings summarize the job preservation and career progression landscape for maintaining employment in the NCS workforce over time.

Retention and Advancement Barriers and Gaps

27.	28.	29.	30.
Shrinking budgets have reduced staffing and increased project loads for professional NCS workers at agencies, SWCDs, and land management nonprofits.	Strained working conditions, industry seasonality, and low pay lead to high turnover among field crews.	Many workers view jobs at nonprofits, small contractor firms, and local agencies as temporary positions to wait out openings at higher-paying employers.	Workers without degrees often hit advancement ceilings or cannot move into project lead or project management roles due to limited availability.

27. **Shrinking budgets have reduced staffing and increased project loads for professional NCS workers at agencies, SWCDs, and land management nonprofits.**

    In Oregon's forests and shrub steppe habitats in Southeast Oregon, federal funding and staff reductions have resulted in remaining staff taking on increasing acreage responsibilities. Higher project loads lead to decreased quality of land management.

28. **Strained working conditions, industry seasonality, and low pay lead to high turnover among field crews.** Many workers leave field crew jobs within one year, but field crew jobs that provide full-time, year-round employment and benefits often have longer tenures.

    At some firms, field crew jobs are generally perceived as "steppingstone" jobs for recent college graduates looking to gain field experience before seeking project manager or public agency conservation jobs. This planned transience disincentivizes job quality improvements that might boost retention.

    At other firms, employers interviewed for this project characterized the tough manual labor of field crew jobs as undesirable to local workers. Instead, these contractors rely on expensive visa programs to fill seasonal positions with temporary migrant workers.

29. **Many workers view jobs at nonprofits, small contractor firms, and local agencies as temporary positions to wait out openings at higher-paying employers.**

    This occurs among planning positions at SWCDs, conservation districts, land trusts, and private restoration firms. Workers see these roles as temporary stops on the way to higher paid jobs at state agencies or in urbanized areas. This is especially true for SWCDs in rural regions.

30. **Workers without degrees often hit advancement ceilings or cannot move into project lead or project management roles due to limited availability.**

    Minimal NCS credentialing for restoration crews and farm workers makes it difficult to recognize workers' transferable skills, especially for those without college degrees. Without transferable credentials, restoration crew members hit ceilings at the foreman and estimator level. A natural progression to a project lead or management role is not always obtainable.

Retention and Advancement Areas of opportunity & improvement

31.	32.
Pay is a major reason workers leave one job for another, and organizations that have increased pay have seen immediate improvements in retention.	With adequate cross-training, seasonal occupations can be combined into year-round jobs.

31. **Pay is a major reason workers leave one job for another, and organizations that have increased pay have seen immediate improvements in retention.** Rural workforce leaders credited recent pay increases for wildland firefighters with better recruitment and retention of local workers that live in rural Oregon.

    Compensation surveys and analyses have helped organizations across the NCS sector adjust pay and benefits and improve staff retention. The Oregon Association of Conservation Districts (Association) is conducting a statewide compensation survey of district employees. The Association hopes the published findings will help individual SWCDs adjust their budgets to promote parity across regions.

    Similarly, nonprofit land management organizations shared that internal pay and benefit analyses led to compensation increases and significantly improved retention. Agencies that already exhibit strong retention attribute their success to adequate and competitive compensation.

32. **With adequate cross-training, seasonal occupations can be combined into year-round jobs.**

    Geographic coverage and diverse service offerings have helped field crew employers keep teams together beyond a typical restoration season. One contractor has succeeded in keeping people employed in the off-season through a combination of service area expansion, development of a year-round nursery, and employee cross-training. Another contractor cross-trains work crews on wildland firefighting.

POLICY RECOMMENDATIONS

The recommendations in this section are intended to serve as a roadmap for ongoing collaboration between state, regional, and local agencies, workforce development training providers, contractors, among others. Grounded in input from interviews and engagement with working groups, this section focuses on practical actions that support the growth of the NCS workforce. This report organizes recommendations into four areas:

Coordination, Contracting, and Procurement
These recommendations address how state agencies involved in carbon sequestration work and workforce development can take actions within their coordination, contracting, and purchasing power to support quality NCS jobs.

Recruitment and Hiring
These recommendations aim to support NCS job seekers at key junctures in their worker journeys – when seeking employment and at the time of hire. These recommendations include activities that span the public, private, and nonprofit sectors.

Training and Advancement
These recommendations aim to support NCS workers as they gather additional skills and advance. within the industry. These recommendations include activities that span the public, private, and nonprofit sectors.

Metrics, Monitoring, and Accountability
These recommendations focus on tracking the growth of the NCS workforce over time.

Coordination, Contracting, and Procurement

State agencies engaged in NCS are well positioned to convene partners across state, federal, local, and Tribal governments to co-plan and co-invest in the workforce required to deliver successful NCS projects. In many regions, these partners — along with private contractors and nonprofit organizations — already collaborate on NCS project planning, implementation, and maintenance, creating a natural opportunity to more intentionally align long-term workforce strategies. By leveraging these existing partnerships, state agencies can help build a stronger, more stable workforce and support the long-term growth of the NCS workforce.

Rural communities host the vast majority of NCS projects, yet they also face some of the deepest underinvestment in workforce development, training, and community infrastructure needed to grow quality jobs. A “Rural-Forward” strategy that centers the unique conditions, challenges, and opportunities in rural Oregon can elevate innovative approaches tailored to these communities. Because the NCS sector is deeply rooted in rural landscapes and Tribal homelands, targeted investments can have

the greatest impact. Building a strong, diverse, and locally rooted workforce and creating quality jobs can support long-term community and economic resilience.

The recommendations below outline how the state can accelerate NCS investments while strengthening job quality, community benefits, and rural economic resilience.

1. **Create a Statewide NCS Workforce Strategy.**

   A state-led workforce strategy could define competency standards, align training providers, and expand apprenticeship-like pathways for careers in NCS. Investments in bilingual training, focused supportive services, access to drivers' education, micro-credentialing, and Tribal-led workforce and education programs will ensure workers — especially in rural and Tribal communities — have stable, high-quality job opportunities.

2. **Lead a Regional, Coordinated Approach to NCS Planning, Implementation, and Maintenance.**

   State agencies could establish a regional planning framework that aligns funding, permitting, and project timelines across watersheds, counties, and Tribal Nations. This approach could convene regional partners — Tribes, counties, community-based organizations, conservation districts, and workforce boards — to identify shared priorities, map high-impact NCS projects, and set common standards for contracting, workforce development, and community benefits. Oregon could also build on the Governor's Regional Solutions structure, which operates across 11 regions aligned with the state's federally designated Economic Development Districts. Leveraging and expanding this existing structure provides a sound foundation for a coordinated, regional NCS strategy that is collaborative, efficient, and aligned with long-term workforce and community goals.

3. **Align Multiple NCS Projects into Year-Round Employment Contracts.**

   To address seasonality, workforce churn, and administrative inefficiencies, state agencies that manage NCS contracts could bundle multiple NCS projects — for example, reforestation, riparian restoration, invasive species removal, habitat restoration — into larger procurements. Bundling creates economies of scale, provides a more reliable pipeline of work for contractors, and can support availability of full-time employment for NCS workers.

4. **Coordinate Braided Funding and Multi-Year Grant-making Strategies.**

   With a regional plan, the state could establish regional NCS "funding hubs" that braid federal, state, and philanthropic dollars and provide multi-year grant commitments for workforce development. Braiding is a strategy where multiple funding streams are coordinated to support a common goal. This approach reduces fragmentation; simplifies access for non-profits, workforce boards, CTE programs, local governments and Tribes; and enable long-term ecological and workforce planning.

   Tribes would especially benefit from efficiencies in contracting and grantmaking as many rely on grant funds to retain staff. Streamlined and assisted application and reporting requirements could increase funding accessibility. Similarly, extending grant timelines from one year to multi-year cycles can increase Tribal capacity and project impact. Finally, expanding allowable expenses to include items like vehicles, drivers' education, among other needs, could increase Tribal autonomy and support self-determination.

5. **Formalize Tribal Co-Governance and Support Tribal-Led NCS Projects.**

   State agencies could co-create funding and planning processes with Tribal Nations, supporting Tribal sovereignty, Indigenous ecological knowledge, and cultural stewardship practices such as cultural burning. This includes dedicated and accessible multi-year grant making, Tribal-led monitoring and research programs, partnerships with Tribal Colleges, and co-governance frameworks. This approach could improve state and Tribal relations and enhance Tribal capacities to implement meaningful and impactful NCS projects across the state.

6. **Increase Contractor Supply and Capacity through Expanded Access to Public Contracts.**

   Small contractors comprising one-to-five employees make up the majority of private NCS employers. Small, rural, or BIPOC-owned contractors frequently lack the administrative capacity to secure ongoing NCS work. State agencies with NCS-related contracts could provide targeted technical assistance, licensing and bonding support, and multi-year prequalification to stabilize contractor pipelines. These actions strengthen local capacity and ensure investments stay rooted in the communities where projects occur.

7. **Explore wider use of PLAs or CWAs to implement labor standards on contracts above a certain size or scale.**

   Project labor agreements (PLA) and community workforce agreements (CWA) use collective bargaining to promote the public interest, ensuring projects are completed on time and economically while also maximizing economic development opportunities for surrounding communities and businesses. These agreements have been deployed in the construction sector to great success. Moving forward, state agencies that contract out major NCS projects could use these tools to ensure the hiring of local workers and contractors.

8. **Review and revise evaluation criteria for contractor selection on NCS investments and projects.**

   State agencies that contract NCS work could review and potentially revise their contractor selection criteria to award additional points to contractors or teams that can show knowledge and incorporation of indigenous traditional ecological and cultural knowledge (ITECK) into their project planning and implementation approach. ITECK has been developed by Indigenous peoples' relationship to land and place over thousands of years and can provide invaluable insight into modern methods that align with natural processes for holistic ecological function.

9. **Lower Barriers to and increase compensation for NCS workers.**

   Interviews with contractors and training providers revealed a variety of hiring practices that are hindering accessibility to NCS jobs. Updating or offering new guidance to employers and agencies could help address this need. The state could collaborate on resources or standard language for employer or agency reference and integration into their own documents.

   - Lower Hiring Barriers for Entry-Level Positions: The state could offer guidance to lower hiring barriers for all entry-level positions. Many NCS positions require licensing or certification, such as a driver's license or CPR training, potentially dissuading applicants who may not hold those licenses at the time of applying. Allowing new employees up to 90 days to attain their needed certifications (and stating this requirement on a job posting) can widen the pool of likely applicants.
   - Discourage Unpaid or Volunteer Labor: Further, agencies could discourage the use of unpaid internships or volunteer labor as a means for contractors to implement restoration activities.

While volunteer experiences expose individuals to the field, volunteers may lack the skills and experience for restoration tasks, which can lead to poor quality work and delays. Interviewees noted the value of internships: they provide job seekers with essential on-the-job training they may not have gotten otherwise and provide critical support for smaller or lesser-resourced organizations. However, working without compensation disproportionately benefits individuals who can afford to forgo income.

- Explore requiring Prevailing Wage Standards: Where allowable, public-sector NCS projects could require prevailing wage standards. Prevailing wage standards ensure local participation and ensure wages compete with the local market and include benefits. The Bureau of Labor and Industries (BOLI) determines which occupations are subject to prevailing wage. Most NCS occupations mentioned in this report do not fall under prevailing wage. While many NCS occupations enjoy wages at or above the median for the state – such as architecture and engineering managers, project managers, and supervisors – others are far below the median, often below $50,000 annually. Given the need to attract and retain an NCS workforce over time, the state could consider adding key NCS occupations to Oregon's prevailing wage standards, with a focus on the lowest paid jobs.

Recruitment and Hiring

These recommendations aim to support NCS workers when entering the NCS sector. Recommendations span creating partnerships between accredited training programs and the public sector to great bridges to full time employment, as well as lowering barriers where practicable to ensure the widest pool of applicants. Further, common barriers like lack of housing, transportation, and quality childcare came up frequent barriers to job access. These recommendations include activities that span the public, private, and nonprofit sectors.

10. Explore leveraging Oregon's existing childcare and labor partnerships to expand childcare capacity and strengthen workforce development outcomes.

Childcare deserts are areas where three or more children compete for a childcare slot in licensed centers and home-based providers. Childcare deserts characterize many of the counties where NCS projects are underway. The State of Oregon has engaged in successful labor-community partnerships that have advanced both workforce training and childcare infrastructure. One example is the Oregon Department of Transportation (ODOT)-BOLI's Highway Construction Workforce Development Program. Apprentices in targeted trades (painters, operating engineers, ironworkers, carpenters, cement masons, and laborers) are offered childcare subsidies that are paid through the infrastructure of the state's Employer Related Day Care (ERDC) program using non-ERDC funds.

In 2024, the Oregon Legislature passed House Bill 4098, allocating $5 million from the Oregon CHIPS Act to the new Oregon CHIPS Child Care Fund. The Fund directs Business Oregon to partner with BOLI to expand its successful Apprenticeship-Related Child Care (ARCC) program and support childcare for workers in the semiconductor industry.

State agencies could leverage existing efforts to meet NCS workforce needs in childcare through the following actions:

- Explore expanding BOLI's ARCC to cover NCS jobs connected to training programs*:* Currently, this state program covers those working on highway projects, but it could

expand to NCS-related jobs, especially for workers in the first one to two years of their careers and training.

- Explore the development of Target Child Care Infrastructure Program Grants: The Child Care Infrastructure Program, housed in Business Oregon, provides grants to childcare providers in rural regions. State agencies could work together to direct grants to rural areas that have planned, multi-year NCS projects, thus increasing childcare slots for workers on these contracts.
- The Department of Early Learning and Care (DELC) could explore collaborating with the Higher Education Coordinating Commission (HECC), Business Oregon, Department of Human Services (DHS), other state agencies, and Tribal Nations to plan and co-invest in childcare solutions: The DELC and related agencies could collaborate with Tribes to co-create a targeted childcare strategy and investment plan for the unique needs of NCS workers and Tribes – particularly in the areas where multi-year NCS investments are planned.

11. **Explore the development of a variety of housing solutions to serve workers in the N&WL sector, including low-income rental housing, seasonal housing, employer-provided housing, community-based farmworker housing, among others.**
    - **Support Regional, Workforce-Focused Housing Initiatives:** State agencies could coordinate across jurisdictions to develop a housing needs assessment for the NCS workforce, including farm and forestry workers, with a focus on strategies that reflect local labor needs. This includes creating workforce housing plans tied to major projects or project clusters, industry clusters, and emerging opportunities such as NCS and clean energy projects.
    - **Explore expanding grant guidelines to include housing assistance:** Grantmaking rules could be broadened to allow funding for a full range of housing solutions that support workers in the N&WL sector. Eligible uses could include direct rental assistance, seasonal or temporary workforce housing, employer-supported housing, and community-based farmworker housing, as well as longer-term strategies. Grants could also encourage partnerships among employers, housing authorities, Tribes, and community-based organizations to ensure housing solutions respond to local needs and cultural contexts.
    - **State leaders could leverage state and federal programs to expand and improve housing for NCS workers:** To meet the housing needs of rural NCS workers, the state could leverage several existing programs, such as Senate Bill 1537's Housing Accountability and Production Office (HAPO) and the Housing Infrastructure Support Fund, among others. This includes providing direct rental assistance, increasing the supply of affordable units, and reducing barriers to rental or mortgage qualification through flexible documentation or co-signer programs. Communities could also support lower-cost homeownership models such as community land trusts and housing cooperatives, which create sustainable ownership opportunities for farm workers.
    - **Support Community-Led and Culturally Rooted Development:** Engaging Tribes, community-based organizations, and youth-serving organizations is critical to ensure housing solutions reflect community priorities and serve those most affected by shortages. The By and For Initiative – Native American Tribes of Oregon (BAFI-NATO) provides state funding to create or strengthen programs that prevent and reduce homelessness in Tribal communities. Funds may support a wide range of activities, including outreach, shelter and housing services, homelessness prevention, rapid re-housing, data collection, facility acquisition or renovation, and community capacity building.

12. Explore locating drivers' education and testing facilities in rural parts of the state.

The lack of drivers' education and testing facilities in rural areas of the state is a barrier for youth workers entering the NCS workforce. Oregon DMV could explore a variety of solutions to help connect job seekers to driver and motor vehicle services. The state could consider co-locating DMV satellite locations with workforce development centers, community colleges, libraries, post offices, and other public-serving institutions.

13. Develop model hiring language that allows candidates to qualify for entry-level NCS jobs through equivalent experience rather than strict credential or degree requirements.

Several public sector interviewees shared that many requirements that are common on job postings (such as a four-year degree) may not be essential to job success. Employers are increasingly relaxing extensive job requirements to widen candidate pools and address worker shortages. For example, hiring managers may wish to review where requirements can be relaxed, and if equivalent to on-the-job experience, an associate's degree, Indigenous ways of knowing, and lived experience can be considered instead. This may be beneficial for entry-level positions at rural agencies that report losing promising employees to urban districts offering higher pay.

This flexibility could expand access for rural residents, Tribal community members, re-entry workers, and others who have gained relevant skills through lived experience, on-the-job learning, ITECK or community-based training programs.

14. Explore scaling the use of agreements between accredited conservation programs and full-time jobs in the public sector.

Public agencies could explore reciprocity agreements with accredited conservation programs throughout the state. Graduates of NCS programs – particularly Tribal training programs – struggle to get placed in permanent positions post-program. Under a reciprocity agreement, graduates with relevant training can apply to state positions with the equivalent of one-two years of on-the-job experience, which can help entry-level candidates meet more minimum qualifications.

Training and Advancement

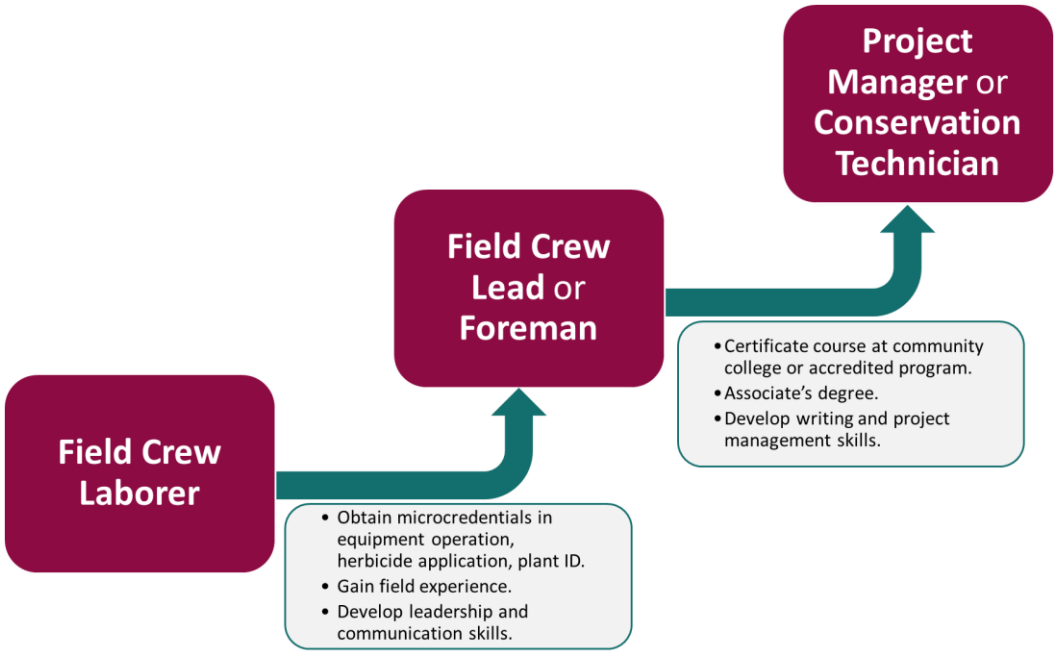
These recommendations aim to support NCS workers in gaining new skills and advancing through the industry. Oregon boasts from a wide array of NCS training programs that need support to scale and meet growing interest from BIPOC, youth, and re-entry populations. There are also opportunities for ongoing learning to ensure incumbent workers have the needed skills to successfully perform NCS work in a way that ensures the State can meet its climate goals.

15. Explore expanding and scaling existing NCS-related training programs and regional training opportunities through coordination and investments, especially for rural communities, youth, and Tribal Nations.

Oregon's NCS training programs provide hands-on experience across natural and working lands and serve as a key connection point for rural communities, youth and Tribal citizens to build NCS careers. Consistent, predictable funding and effective program alignment are essential to expand program capacity and increase access for youth, re-entry populations, and workers from underrepresented communities.

- Develop an N&WL workforce sector plan: The state could establish a new N&WL workforce sector plan housed in the Higher Education Coordinating Commission (HECC) to strengthen alignment among NCS employers, training programs, community colleges, and Tribal nations.
- Continue and increase support to youth-focused programs: The HECC could strengthen and elevate youth-focused programs, including Tribal-administered programs, within its NCS workforce sector plan by providing increased funding for capacity building and supportive services — such as stipends and financial assistance — for youth NCS training programs. This expanded focus could also include convening statewide programs to address recruitment and retention challenges, share best practices, and build stronger connections between rural and urban regions. A unified, statewide approach could also help address systemic barriers — such as access to drivers' education and other hiring and recruitment obstacles — that consistently affect youth across programs.
- Leverage upcoming Workforce Pell Grants: The state could plan for the launch of the new Federal Workforce Pell Grants on July 1, 2026, to expand NCS education and training pathways. Workforce Pell Grants will allow eligible individuals to use federal aid for short-term, career-focused programs — an opportunity to help restoration crew members advance into project management, planning, and other technical roles. The HECC can play a coordinating role by engaging community colleges and training providers to align programs with Workforce Pell requirements.
- Support transparent restoration career pathways with training, credentials, and skill development: Restoration crew jobs are vital for NCS implementation across Oregon, but often offer low wages, seasonal work, physically demanding tasks, and few advancement pathways. These factors make it difficult for field crew workers to build long-term careers in the industry. In interviews, employers shared advancement pathways for field crew members, one of which is visualized in **Figure 23**. With targeted training, proper credentials, and skill development, employers saw potential for promotion to field crew leadership and project management roles.

Figure 23: Career Lattice Map: Laborer Pathways to Higher Paid/Skilled Work.



- **Direct investments to support the reentry population:** NCS jobs offer low barriers to entry and are well-suited for individuals in reentry, including those who begin training while incarcerated and continue working after release. Oregon could expand investments in reentry workforce programs and formalize pathways into NCS careers. The WorkSource Oregon Reentry Program — developed by Oregon Workforce Partnership (OWP) in collaboration with all nine Local Workforce Development Boards — provides a strong foundation by delivering job placement, skills training, and coordinated support for Adults in Custody (AICs) beginning 90 days prior to release and continuing post-release in their communities. Building on successful pilots, such as the Deer Ridge Correctional Institution partnership with the U.S. Forest Service on fuels-reduction work, the state could scale similar models statewide. Doing so could increase access to meaningful training and support successful reintegration.

16. Develop NCS-related credentialing for workers and contractors to upskill the current workforce and improve wage and career prospects.

The NCS field is consistently evolving. As practitioners elevate new and existing ways to manage natural and working lands, there is an ongoing need to ensure that contractors and workers have access to ongoing learning. This could not only lead to more effectively implemented projects but also create opportunities for advancement and retention in the field.

- **Explore the viability of an NCS-related maintenance credential**: The state could strengthen and standardize NCS training by determining if an NCS maintenance certification is needed. Existing curricula such as those offered by The Nature Conservancy, Audubon Society, and/or community colleges and universities, can be leveraged for this purpose. Certification requirements for state-funded projects could help ensure improvements are meeting standards over time. The state could engage NCS experts to define the specific skills and competencies required for maintenance work across Oregon's N&WL, and partner with educators and training providers to refine or develop a high-quality NCS curriculum. This work could also explore credentialing pathways, including alignment with Workforce Pell Grants to support community and Tribal college-based programs, and the development of a certification process — ideally through a state-registered apprenticeship program — to ensure consistent, portable, and industry-recognized training.

- **Provide ongoing technical assistance to support implementation of NCS in the farming sector:** The state could support ongoing learning and technical assistance for the farming sector to better integrate NCS practices on working lands. The state could support the sector in several ways:

    - Soil health programs that educate and support producers and farm service providers have lost federal funding in recent years, and their long-term outlook is uncertain. Resourcing organizations to do culturally competent, one-on-one consultation soil testing, technical assistance, and access to financial incentives and resources will help facilitate the implementation of sustainable land management practices. Supporting this work could create demand for contractors to help implement improvements or provide other technical expertise as needed.

- Resourcing training programs that support BIPOC farmers and farmworkers – such as Adelante Mujeres – are a way to scale up sustainable land management practices among BIPOC farmers and farmworkers.

- **Partner with Tribal Nations and Tribal Colleges to explore the creation of an ITECK certification system:** The state and Tribal Nations could establish a credential program that recognizes and elevates ITECK as a core NCS skill set. ITECK is rooted in thousands of years of land stewardship and offers essential insights into ecological practices that align with natural systems. Creating a certification system in partnership with Tribal Nations and Tribal colleges could support the training, validation, and funding of this critical expertise within the NCS workforce.

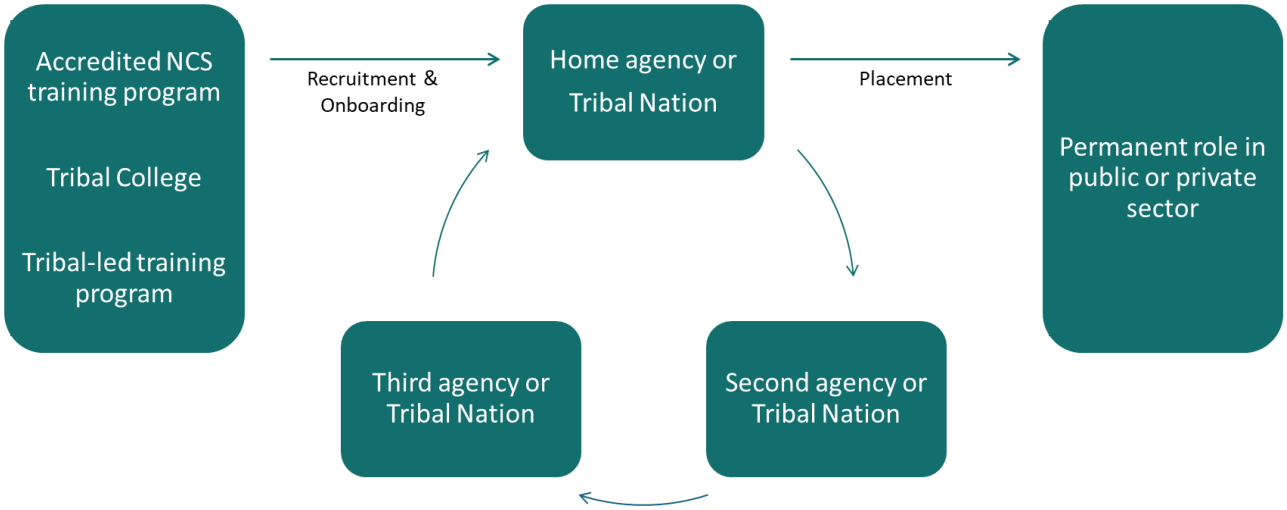
17. Explore creating a cross-agency, paid, public sector "NCS Fellows" program that gives early-career workers hands-on experience across multiple land types and agencies, including Tribes.

Under this model, "NCS Fellows" would rotate through departments such as Department of State Lands (DSL), ODOE, Oregon Department of Fish and Wildlife (ODFW), and Tribal Nations, building a broad skill set before transitioning into permanent roles in the public or private sector. Participating agencies (including Tribes) could jointly identify job classifications that can operate across multiple agencies. Because these projects often occur in the same regions or within the same Tribal Nation, this alignment creates opportunities for Fellows or trainees to rotate across state-funded projects while building a broader, transferable skill set. Agencies can define rotation pathways for roles such as entry-level foresters, planners, environmental technicians, or researchers.

This coordinated approach also reflects Tribal perspectives, which recognize the interconnectedness of energy, water, soil, cultural resources, and land stewardship — areas often siloed within state agencies. A cross-agency strategy would honor this holistic framework while building a more flexible and skilled workforce to support long-term NCS and clean energy deployment.

Recruitment of fellows should come from accredited NCS training programs, Tribal Colleges, and Tribal-led training programs. Oregon's Human Resources Office can provide compensation structures, career placement services, and related support. See **Figure 24** for a visual description of this program.

Figure 24: Career Lattice Map: Rotating Fellows Program



Metrics, Monitoring, and Accountability

These recommendations focus on tracking the growth of the NCS workforce over time. It is difficult to characterize the industry and related occupations using standard industrial and occupational classification systems. This will present challenges for tracking the size and health of the NCS workforce ecosystem over time. Continuing to work toward accurate and comprehensive accounting of NCS industry activities is critical for attracting and informing future workforce investments. Trained, skilled, and diverse workers that can plan, implement, and maintain natural climate solutions are integral for the state's ability to address climate change.

18. Track NCS specific data on industry composition and occupations.

In the forestry sector, OED and industry organizations manually identify forestry-related firms that fall into NAICS-based industries, like transportation, that serve other segments of the economy as well.[18] State agencies, industry organizations, and employers could partner on a similar effort for NCS-related industries and firms. On the occupations side, interested state agencies might wish to conduct additional engagement – such as surveys or focus groups – to fully identify the level of alignment between formal occupation descriptions and the occupations as practiced in the field. The knowledge gained could help trainers, educational institutions, and others to better align curriculum needs with the evolving needs of the sector.

Further, individual proprietors and self-employed workers represent 11 percent of the NCS workforce. This is a promising area of further research. Further engagement with individual proprietors in the NCS sector (focus groups or one-on-one interviews) will help to better understand their business needs and how to support their long-term retention in the industry.

[18] https://www.oregon.gov/workforceboard/data-and-reports/Documents/Forestry%20Operations%20%26%20Management%20Workforce%20Study.pdf

19. Agencies could track the number and type of jobs created through state-funded NCS investments, and report workforce outcomes publicly.

Administering agencies could collect information on jobs and training services that are supported by NCS-related investments. The type of information could include items such as number of jobs, types of occupations, average hourly wages, and total project hours. If a project contains on-the-job training, the agencies could collect number and type of trainees, types of trainees, total number of training hours, etc. To lessen administrative burden on smaller projects, administering agencies could consider a threshold for reporting.

The state could also consider reporting on this data publicly through a user friendly, public facing dashboard to demonstrate the economic benefit of NCS projects and shore up support for investments across the state.

20. Track data on NCS training placements and retention.

The project team conducted landscape scan of exemplary NCS training programs. Information on job placements, and retention in the field over time following graduation, were frequently unavailable. The lack of data highlights a significant challenge in determining if workforce development programs are leading to sustained employment in the field. The state could lead by requiring public-sector funded NCS programs to track retention rates at 6-, 12-, and/or 24-months post-training. An agency such as the HECC, which specializes in understanding and deploying workforce investments, could collect and analyze this data as part of a broader sector strategy.

21. Assess future demand for NCS projects to more accurately anticipate near and mid-term workforce needs.

ODOE and partner agencies could seek funding for a demand study to gain a more accurate assessment of the number and types of occupations needed to plan, implement, and maintain NCS projects. Demand studies typically include an inventory of planned infrastructure projects (at the local, regional, and state level) over the next 5 years, compared to the supply of workers available in the immediate and longer term along the same timeframe to deliver on those projects. The analysis can show agencies how many and what types of workers they need and reveal any gaps. Work systems in Portland conducted a similar demand study for the construction sector. The results informed public agencies in the Portland region on how to more effectively invest resources toward the promotion of equitable growth in the region’s economy.

CONCLUSION AND NEXT STEPS

This Study is the first attempt to understand who comprises the workforce that deploys natural climate solutions and what they need to succeed as well as the training and coordination infrastructure necessary to increase the pace and scale of implementation of NCS across the state. While the results provide a useful starting point for understanding the current state of the NCS workforce, additional specific NCS occupation data will be important to refining this assessment in the future. Because there is no defined NCS Industry nationally, some of the information in this report is derived from the inclusion of other industries that support NCS, but within which NCS is not their primary area of work (e.g., trucking and agriculture). Other occupations may have been missed in the analysis. However, the following key points from the Study remain important as Oregon considers opportunities to build and strengthen its NCS workforce:

- **NCS will have outsized benefits to rural economies and rural workforces in Oregon.** Because implementation of NCS relies on Oregon's core natural resource industries, accelerating adoption of NCS, supported by technical assistance and incentives where needed, can open new markets and provide added resilience to Oregon's natural and working lands.
- **NCS requires engagement of people in a wide range of industries.** For some of these industries, additional education, training and technical assistance will be important to build increased awareness of the climate benefits of specific practices that can be deployed.
- **Investments in workforce in urban communities will also provide significant benefits.** Urban greenspace certifications are growing and supporting the urban NCS workforce in urban greening efforts has plentiful additional benefits including to public health and reduced energy costs.
- **Today's youth are attracted to mission driven jobs and motivated to address the future impacts of climate change in particular.** The state can support this interest with greater investment in NCS education and training opportunities, particularly as a significant portion of the NCS workforce nears retirement.
- **Several programs are already in place that demonstrate successful approaches for holistic training and providing greater access to create a diverse NCS workforce.** Great examples of these programs include Friends of Tryon Creek's Green Leaders, Ecotrust's Green Workforce Academy, and Adelante Mujeres' Regenerate Agriculture program. Several of these programs have demonstrated successful approaches to centering Indigenous Traditional Ecological and Cultural Knowledge (ITECK) and braiding ITECK and western science together. Oregon can use these as models for broader application in the state to ensure that the NCS workforce lifts up communities and incorporates all types of land care knowledge.
- **Key challenges with NCS jobs mirror key challenges in other natural resources industries including access to benefits, childcare, housing, and transportation.** NCS could be another reason to invest in helping remove these key barriers.

APPENDIX A: WORKFORCE PARTNER INTERVIEW LIST

Workforce Partner Interviewees

1. Ash Creek Forestry Management
2. BlueGreen Alliance Foundation
3. Clean Water Services
4. East Cascades Works
5. Eastern Oregon Workforce Board
6. Franco Reforestation
7. Integrated Resource Management
8. Jefferson County Soil and Water Conservation District
9. Kiewit Infrastructure West Co.
10. Lake County School District 7
11. Lomakatsi Restoration Project
12. State Legislator
13. McKenzie River Trust
14. Oregon Association of Conservation Districts
15. Oregon Climate & Agriculture Network
16. Oregon Department of State Lands (DSL)
17. Oregon Higher Education Coordinating Commission (HECC)
18. Oregon Metro
19. Oregon Natural Desert Association
20. Oregon Parks and Recreation Department (OPRD)
21. Pacific Habitat Services
22. Professor, Oregon State University, Lake Labish Project
23. Rogue Workforce Partnership
24. Small Farmer
25. Springboard Forestry and Hyla Woods
26. Sustainable Northwest
27. Trask Design and Construction
28. Tualatin Soil and Water Conservation District

Tribal Nation and Tribal-Related Organization Interviewees

1. Chinook Indian Nation
2. Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians
3. Confederated Tribes of Warm Springs
4. Ecotrust Green Workforce Academy (partnership with Blueprint Foundation, Native American Youth and Family Center, Self Enhancement Inc., and Wisdom of the Elders)

Appendix B: Detailed Workforce Assessment Approach

The first step of this assessment was to define the NCS industry. The industry definition itself is simply a list of selected industries within which NCS activities do take place or are likely to take place. An iterative process identified a select number of industries based on criteria, including each industry's relation to performing NCS-related activities. "Natural Climate Solutions" is not a formal industry category in any existing, reliable data set, so the project team developed these definitions by identifying where NCS activities occur based on both quantitative and qualitative data gathered throughout this work, including ODOE's example list of natural climate solutions and refined understanding of NCS activities via engagement activities.

While studying N&WL as a holistic workforce sector is a new endeavor for the State, the industries and occupations that implement or could implement NCS already exist. The project team aligned NCS activities with the industries and occupations that already exist in Oregon's labor market and that are most likely to be engaged in planning, implementing, or maintaining NCS projects. To define the NCS industry, the project team relied on the North American Industry Classification System (NAICS). NAICS organizes economic activity into standardized codes that allow analysis at multiple levels of detail, depending on the data source.

Defining NCS industries using NAICS is inherently imperfect. Industry codes rarely align exactly with the full set of activities involved in NCS work, and all industries contain a mix of NCS and non-NCS activities. For this reason, the industries in our definition vary in how closely they reflect NCS activities. Some sectors are more NCS-specific (e.g., conservation organizations), while others are less-specific (e.g., transportation), meaning they include a larger share of activities that likely would not be defined as NCS activities. Where the data allow, the analysis distinguishes between industries that are more central to NCS activity and those where NCS-related work is less concentrated.

Industries that could be considered ancillary support services or part of the supply chain that supports NCS planning, implementation, and/or stewardship were excluded from this study. Examples of excluded industries are manufacturing, wholesale trade, retail trade, real estate rental and leasing, legal services, and educational services. Many excluded industries are large and encompass services to many industries, making it difficult to assess to what extent they explicitly support NCS implementation. Future analyses could potentially identify NCS-specific entities and employment within excluded industries.

Once the NCS-related industries were defined, the project team identified the key occupations associated with them using Oregon's Industry–Occupation (IO) matrix.[19] Throughout the process, interviews with NCS practitioners and ongoing discussions with interagency partners helped validate both the industry and occupation definitions. These qualitative insights provided important context for interpreting industry and occupational classifications and ensured that the technical methods accurately captured how NCS work is organized and performed in Oregon.

Standard occupation titles from the Standard Occupational Classification (SOC) do not always reflect the names by which occupations, professions, and jobs are known in the "real world." Appendix D includes a

[19] Each occupation is cross-walked to the industries within the NCS definition, allowing calculation of two core measures: (1) *share of industry employment* (the percentage of an industry's workforce represented by a given occupation), and (2) *share of occupation employment* (the percentage of an occupation's total workforce employed within selected NCS industries). Where Oregon-level data were suppressed or insufficiently granular, national IO data are used to supplement the analysis and maintain coverage across occupations.

table of formal titles cross-walked to common and alternative occupation titles used and shared during interviews and other engagement activities.

NCS Workforce Categories

Oregon's NCS workforce requires a wide range of skills due to the diversity of activities across related industries. Land use sector categories are one way of organizing NCS work, but they do not capture the full scope and crossover of the workforce that plans, implements, and maintains NCS across the state. To assist in organizing the range of workers needed to successfully expand and support NCS, the project uses an additional framework that defines NCS work by project phase—plan/design, implement/build, and maintain/monitor—rather than by land sector alone. Many industries and occupations span multiple stages of NCS and overlap across sectors; this framework allows for a clearer understanding of cross-cutting roles.

Plan/design work involves developing project plans, conducting research, creating technical designs, and providing guidance for how systems or projects should be built and managed. Implement/build work covers activities like construction, farming, and resource extraction; essentially, the physical work of building, producing, or installing what has been designed. Maintain/monitor work keeps systems and environments operating over time. This workforce maintains equipment or landscapes, monitors environmental conditions, and manages day-to-day operations once projects or systems are in place.

Data Sources and Limitations

The analyses for this workforce assessment draw on several key datasets to describe employment patterns, wages, and workforce characteristics across Oregon's NCS workforce. In addition, the research team relied on committee and working group engagements, as well as findings from individual interviews, to define NCS industries and identify key occupations.

Wage and employment information primarily come from the Quarterly Census of Employment and Wages (QCEW), the Bureau of Labor Statistics' Occupational Employment and Wage Statistics (OEWS), the Oregon Employment Department (OED), and the U.S. Census Bureau's Nonemployer Statistics (NES). QCEW data provide information on the number of establishments, monthly employment, and quarterly wages by industry for workers covered by OED law and by the program of Unemployment Compensation for Federal Employees (UCFE). BLS and OED data provide detailed occupational wage estimates and industry-level employment counts. Together, these sources offer complementary perspectives on wage levels and employment structure across both industries and occupations in comparison to the rest of Oregon.

Demographic data, including information on age, sex, race, ethnicity, and educational attainment, are derived from the ACS and its Public Use Microdata Sample (PUMS). These sources provide individual-level data that allow for demographic and occupational profiling of workers engaged in NCS industries across Oregon.

These datasets have some inherent limitations, described at a high level in the approach section above, and mainly relating to the precision of identifying NCS-focused industries, employers, and workers in Oregon. The two main limitations can be summarized as follows:

- Industry codes rarely align exactly with the full set of activities involved in NCS work, and all industries contain a mix of NCS and non-NCS activities.

- Standard occupation titles do not always reflect the names by which occupations, professions, and jobs are known by employers and workers (e.g., ecologists and naturalists employed by the restoration sector are not easily identified in the data).

APPENDIX C: NCS INDUSTRIES: DETAILED NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODES WITH LAND TYPES AND NCS PROJECT PHASES

Industry and establishment data are categorized using the North American Industry Classification System (NAICS). NAICS codes are "nested" in a way that allows analysis at varying levels of specificity at different geographies—the larger the geography, the more granular the data.[20] The analysis in this assessment uses the most-detailed NAICS-based data available in each data source for the relevant geography (e.g., state, workforce region). The most detailed industry-level data (based on 6-digit NAICS codes) are generally only available in one data source: confidential QCEW data provided by Oregon Employment Department for this study. These data provide employment totals, average pay per employee, and location of establishments. With other data sources, the analysis relies on less-detailed codes (e.g., 4-digit), for example, for workforce characteristics and wages.

QCEW data do not include sole proprietors. Data representing these workers are from the U.S. Census Bureau's Non-employer Statistics (NES). NES counts include sole proprietors, freelancers, and independent contractors who generate revenue but do not have payroll staff. The NES counts establishments; each establishment may involve multiple workers (e.g., a family-run business in which multiple family members are working would count as one establishment).[21]

[20] Industries are defined at various levels of specificity, for example, Agriculture is NAICS 11, beneath that, Vegetable and Melon Farming is NAICS 1112, Potato Farming is NAICS 11121.

[21] U.S. Census Bureau. "About this Program: Nonemployer Statistics." U.S. Census Bureau, https://www.census.gov/programs-surveys/nonemployer-statistics/about.html

NCS Industries: Detailed NAICS, land types, and NCS project phases

NAICS Code 11

NAICS Code 11	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
1111	**Oilseed and Grain Farming**	**Croplands**	-	-	-
11111	Soybean Farming	Croplands	0	1	1
11112	Oilseed (except Soybean) Farming	Croplands	0	1	1
11113	Dry Pea and Bean Farming	Croplands	0	1	1
11114	Wheat Farming	Croplands	0	1	1
11115	Corn Farming	Croplands	0	1	1
111199	All Other Grain Farming	Croplands	0	1	1
1112	**Vegetable and Melon Farming**	**Croplands**	-	-	-
111211	Potato Farming	Croplands	0	1	1
111219	Other Vegetable (except Potato) and Melon Farming	Croplands	0	1	1
1113	**Fruit and Tree Nut Farming**	**Croplands**	-	-	-
111331	Apple Orchards	Croplands	0	1	1

NAICS Code 11	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
111332	Grape Vineyards	Croplands	0	1	1
111333	Strawberry Farming	Croplands	0	1	1
111334	Berry (except Strawberry) Farming	Croplands	0	1	1
111335	Tree Nut Farming	Croplands	0	1	1
111336	Fruit and Tree Nut Combination Farming	Croplands	0	1	1
111339	Other Noncitrus Fruit Farming	Croplands	0	1	1
1114	**Greenhouse, Nursey, and Floriculture Production**	**Croplands**	-	-	-
111411	Mushroom Production	Croplands	0	1	1
111419	Other Food Crops Grown Under Cover	Croplands	0	1	1
111421	Nursery and Tree Production	Croplands	0	1	1
111422	Floriculture Production	Croplands	0	1	1
1119	**Other Crop Farming**	**Croplands**			
11191	Tobacco Farming	Croplands	0	1	1
11194	Hay Farming	Croplands	0	1	1

NAICS Code 11	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
111991	Sugar Beet Farming	Croplands	0	1	1
111992	Peanut Farming	Croplands	0	1	1
111998	All Other Miscellaneous Crop Farming	Croplands	0	1	1
1121	**Cattle Ranching and Farming**	**Grassland/rangeland**	-	-	-
112111	Beef Cattle Ranching and Farming	Grassland/rangeland	0	1	1
112112	Cattle Feedlots	Grassland/rangeland	0	1	1
1124	**Sheep and Goat Farming**	**Grassland/rangeland**	-	-	-
11241	Sheep Farming	Grassland/rangeland	0	1	1
11242	Goat Farming	Grassland/rangeland	0	1	1
1131	**Timber Tract Operations**	**Forest/shrublands**	-	-	-
11311	Timber Tract Operations	Forest/shrublands	0	1	1
1132	**Forest Nurseries and Gathering of Forest Products**	**Forest/shrublands**	-	-	-
11321	Forest Nurseries and Gathering of Forest Products		0	1	1
1133	**Logging**	**Forest/shrublands**	-	-	-
11331	Logging	Forest/shrublands	0	1	1

NAICS Code 11	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
1151	**Support Activities for Crop Production**	**Croplands**	**-**	**-**	**-**
115112	Soil Preparation, Planting, and Cultivating	Croplands	1	1	1
115113	Crop Harvesting, Primarily by Machine	Croplands	1	1	1
115114	Postharvest Crop Activities (except Cotton Ginning)	Croplands	1	1	1
115115	Farm Labor Contractors and Crew Leaders	Croplands	1	1	1
115116	Farm Management Services	Croplands	1	1	1
1153	**Support Activities for Forestry**	**Forest/shrublands**	**1**	**1**	**1**

NAICS Code 23

NAICS Code 23	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
23	**Construction**	**Sector**	**Plan/ Design**	**Implement/ Build**	**Maintain/ Monitor**
237990	Other Heavy and Civil Engineering Construction	All	0	1	0
23891	Site Preparation Contractors	All	1	1	0

NAICS Code 48-49

NAICS Code 48-49	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
48-49	**Transportation and Warehousing**	**Sector**	**Plan/ Design**	**Implement/ Build**	**Maintain/ Monitor**
484	Truck Transportation	All	0	1	0

NAICS Code 54

NAICS Code 54	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
5413	**Architectural, Engineering, and Related Services**	-	-	-	-
54132	Landscape Architectural Services	Urban greenspace	1	0	0
54133	Engineering Services	All	1	1	0
54134	Drafting Services	Wetlands, Urban greenspace	1	0	0

NAICS Code 54	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
54136	Geophysical Surveying and Mapping Services	All	1	0	0
54137	Surveying and Mapping (except Geophysical) Services	All	1	0	0
5416	**Management, Scientific, and Technical Consulting Services**	-	-	-	-
54162	Environmental Consulting Services	All	1	1	1
54169	Other Scientific and Technical Consulting Services	All	1	1	1

NAICS Code 56

NAICS Code 56	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
56	**Administrative and Support and Waste Management and Remediation Services**	-	-	-	
5617	Services to Buildings and Dwellings	-	-	-	-
56173	Landscaping Services	Urban greenspace	0	0	1

NAICS Code 71

NAICS Code 71	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
71	**Arts, Entertainment, and Recreation**	-	-	-	-
7121	Museums, Historical Sites, and Similar Institutions				
71213*	Zoos and Botanical Gardens	Urban greenspace			
71219	Nature Parks and Other Similar Institutions	All	0	1	1

*Excluded from QCEW analysis

NCAIS Code 81

NAICS Code 81	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
81	**Other Services**	-	-	-	-
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	-	-	-	-
811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	All	0	0	1
8133	**Social Advocacy Organizations**	-	-	-	-
813312	Environment, Conservation and Wildlife Organizations	All	1	0	1

NCAIS Code 92

NAICS Code 92	NAICS Title	Land Type	Plan/ Design	Implement/ Build	Maintain/ Monitor
92	**Public Administration**	-	-	-	-
9241	Administration of Environmental Quality Programs	All	0	0	1

*Excluded from QCEW analysis

APPENDIX D: NCS OCCUPATION TITLE CROSSWALK

Industry-level data are organized at the establishment or employer level and encompass all types of work and employment in an industry, regardless of a worker's occupation. For additional details about occupation-level work, the project team identified key NCS occupations to highlight in this analysis.

Occupations were identified using a multi-step process grounded in Oregon's Industry–Occupation (IO) matrix. The most prevalent occupations within each industry were determined based on two main criteria: (1) occupations that make up at least 0.1 percent of total industry employment, and/or (2) occupations where at least 30 percent of workers are employed within that industry. The list was then narrowed down to the occupations included in the assessment exhibits using input from project committee members and study interviewees.

The formal occupational titles used in this assessment are from the Bureau of Labor Statistics Standard Occupational Classification (SOC). The titles do not always reflect the names by which occupations, professions, and jobs are known in the "real world." The table below displays the formal titles cross-walked to common and alternative occupation titles used and shared during interviews and other engagement activities.

NCS Occupation Title Crosswalk

Soc Code	Occupational Title	Common/Alternative Titles	Count Of Mentions
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	Laborers, Farmworkers	6
11-9013	Farmers, Ranchers, and Other Agricultural Managers	Farm manager, Farmers, Ranchers	9
37-3011	Landscaping and Groundskeeping Workers	Maintenance Crew	2
13-1082	Project Management Specialists	Project Manager, Conservation Planner, Natural Resource Project Manager, Restoration Project Manager, Assistance Program Manager	8
53-3032	Heavy and Tractor-Trailer Truck Drivers	-	0
17-2051	Civil Engineers	Civil Engineer, Site engineer	4
33-2011	Firefighters	Firefighter I	1
45-4022	Logging Equipment Operators	Loggers	3
37-1012	First-Line Supervisors of Landscaping, Lawn Service,	-	0

Soc Code	Occupational Title	Common/Alternative Titles	Count Of Mentions
	and Groundskeeping Workers		
47-2073	Operating Engineers and Other Construction Equipment Operators	Earth-moving crew, Grading crew, Operating Engineers, Bulldoze Operators, Machinery Operators, Dump Truck Operators, Excavator Operators	6
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	Field Crew Lead, Stewardship Managers, SFI Manager, Protected Lands Manager, Senior Habitat Restoration Specialist, Crew Lead	15
19-4071	Forest and Conservation Technicians	Forest Technician, Forestry Safety Technicians, Invasive Species Spray Technician, Silviculturist, Conservation Technicians, Viticulturist	3
45-2091	Agricultural Equipment Operators	Heavy equipment operators	5
19-4021	Biological Technicians	-	0
33-1021	First-Line Supervisors of Firefighting and Prevention Workers	-	0
37-3013	Tree Trimmers and Pruners	Arborist, Tree Trimmer	4
19-1023	Zoologists and Wildlife Biologists	Wildlife Biologist	2
19-2041	Environmental Scientists and Specialists, Including Health	Restoration Ecologist, Climate Scientist	2
11-9041	Architectural and Engineering Managers	-	0
19-1031	Conservation Scientists	Conservation Technician, Range Ecologist	4
17-3031	Surveying and Mapping Technicians	GIS technicians, GIS specialist, AutoCAD Specialist, Surveying technicians	7
19-1032	Foresters	Forester, Forest Ecologist	16
19-1029	Biological Scientists, All Other	Biologist	8

Soc Code	Occupational Title	Common/Alternative Titles	Count Of Mentions
19-4042	Environmental Science and Protection Technicians, Including Health	Watershed Coordinator	1
45-4021	Fallers	-	0
23-2011	Paralegals and Legal Assistants	-	0
17-2081	Environmental Engineers	Soil and Water Engineer	1
45-4029	Logging Workers, All Other	Mill workers, Loggers	6
37-3012	Pesticide Handlers, Sprayers, and Applicators, Vegetation	Herbicide applicator	2
19-1013	Soil and Plant Scientists	Soil Scientist, Agronomist	4
53-2012	Commercial Pilots	-	0
19-2043	Hydrologists	-	1
45-4011	Forest and Conservation Workers	Planting Crew, Thinning Crew, Forestry Crew, Field Crew leader, Forestry Consultant, Forestry safety specialist, Forest Managers, Forest Owners, Forestry Safety Specialist, Native Plant Specialist	16
13-1199	Business Operations Specialists, All Other	Grant writing, Grant Management, Fiscal Management, Technical Service providers, Fiscal Administrator, technical assistance	5
49-9071	Maintenance and Repair Workers, General	-	0
11-9151	Social and Community Service Managers	Conservation Program Manager, Conservation Program Supervisor, Program Assistant, Executive Director, Senior Administrator, Outreach Specialist	6
17-3022	Civil Engineering Technologists and Technicians	-	0
11-9121	Natural Sciences Managers	Natural Resource Manager	1
17-1022	Surveyors	Surveyor	2

Soc Code	Occupational Title	Common/Alternative Titles	Count Of Mentions
19-3091	Anthropologists and Archeologists	Archeologist	2
49-3041	Farm Equipment Mechanics and Service Technicians	Mechanics, Forestry Mechanics	1
19-2042	Geoscientists, Except Hydrologists and Geographers	-	0
11-3013	Facilities Managers	-	2
19-4012	Agricultural Technicians	-	0
33-2022	Forest Fire Inspectors and Prevention Specialists	Firewise Coordinator	1
17-1012	Landscape Architects	-	5
13-1131	Fundraisers	Procurement Office	1
43-3061	Procurement Clerks	Grant Specialist	1
19-4043	Geological Technicians, Except Hydrologic Technicians	-	0
19-4044	Hydrologic Technicians	Water Monitoring and Evaluation Technician, Watershed Tech	2
51-9198	Helpers--Production Workers	-	0
17-2021	Agricultural Engineers	-	1

Data source: SOC occupation data; project interviews. Note: Key occupations listed first and sorted by size, followed by supplementary NCS occupations.

APPENDIX E: NCS OCCUPATIONAL PROFILES

The following is a list of the NCS occupations that the consultant team profiled and which will be submitted in January 2026.

- Forest and Conservation Technicians
- Conservation Scientists
- Farmers, Ranchers, and Other Agricultural Managers
- First-Line Supervisors of Farming, Fishing, and Forestry Workers
- Logging Equipment Operators
- Surveying and Mapping Technicians
- Tree Trimmers and Pruners
- Commercial Pilots
- Operating Engineers and Other Construction Equipment Operators
- Pesticide Handlers, Sprayers, and Applicators
- Soil and Plant Scientists (Crop Advisors/Consultants)
- Biological Technicians
- First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers
- Project Management Specialists

Two example profiles are provided here. The first uses quantitative data from available state and federal databases, while the second has less quantitative data available for use specific to natural climate solutions.

Forest and Conservation Technician

Description of Job Duties

Provide technical assistance regarding the conservation of soil, water, forests, and related natural resources. This may look like collecting forestry inventory data and/or assessing ecosystem conditions such as wildlife presence, vegetation cover, and soil quality. Support tasks include stand assessments, fuel load measurements, invasive species removal, and reforestation under the direction of a forester or resource manager. This role supports climate-adaptive forest and land management as well as wildfire mitigation and recovery on public and private working lands to natural climate solutions efforts across regions.

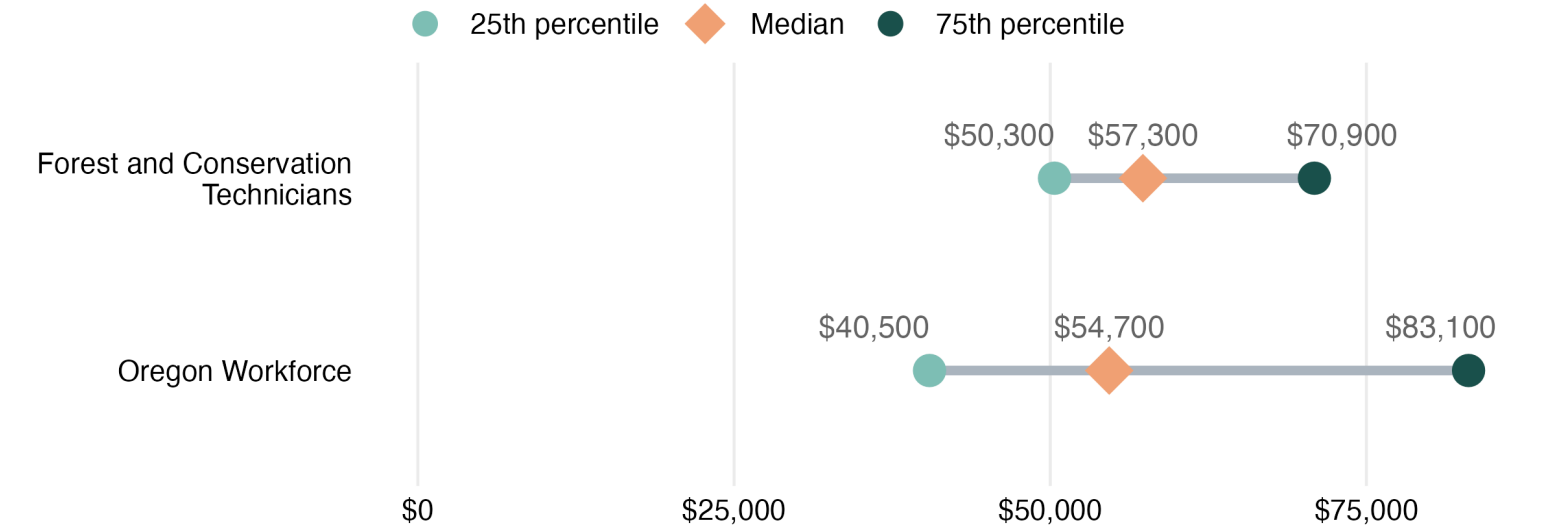
Oregon employment:
1,906

Projected employment (2033):
1,898

Annual average openings:
235

Commonly known as: Conservation Technician, Forestry Aide, Forest Technician, Rangelands Technician, Reforestation Technician, Silviculturalist, Soil Conservation Technician, Wetlands Conservation Technician
Relevant natural and working lands: Forest/shrubland, grassland/rangeland, urban greenspace, wetland
Examples of relevant natural climate solutions: Land conservation and protection, reduced degradation, reduced deforestation, reforestation[1]

Oregon Wages



Note: Wage data do not include self-employment income.

Education/Training

Typical entry-level education: High school diploma
Competitive education: Associate degree
Examples of certifications/licenses: Certified Burn Manager (ODF), Certified Forester (Society of American Foresters), Esri GIS certification

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Skills and Knowledge

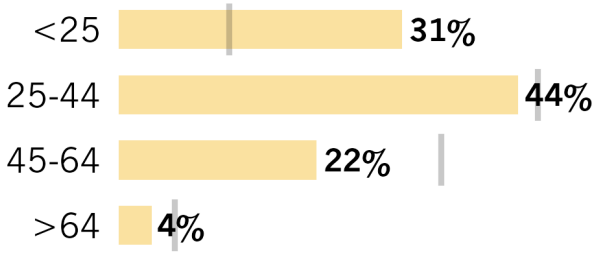
Skill examples	Helpful training
Chainsaw operation	Safety certification and supervised field use
Ecological knowledge	Coursework in forestry, ecology, or natural resources
Fire management	Wildland fire training
Plant identification	Field experience or botany coursework
Restoration techniques	Hands-on experience in forest health treatments, reforestation, or riparian work

Occupation Demographics

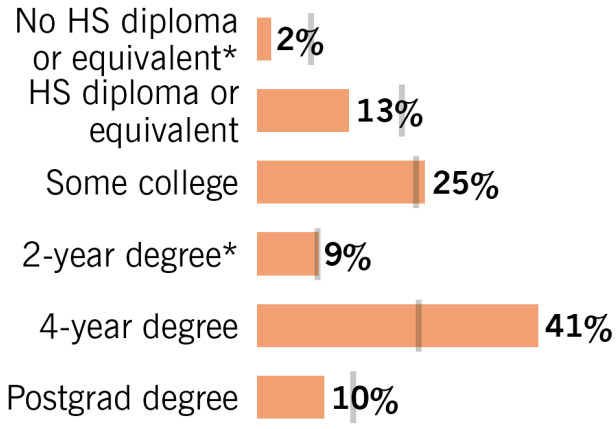
The charts show characteristics of Forest and Conservation Technicians in Oregon (bars) compared to characteristics of Oregon's entire workforce (|).

Sex

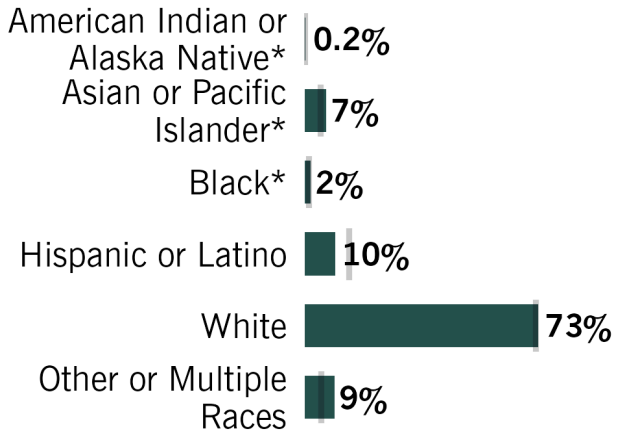
Age



Educational Attainment



Race/Ethnicity



*Data may be unreliable due to small sample size.

Employment and demographic data are for Oregon, 2023. Wage data are for Oregon, 2024.

[1]See NCS literature review

Created: 2025-12-03

Questions? Email AskEnergy@oregon.gov

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Commercial Pilot

Description of Job Duties

Pilot and navigate the flight of fixed-wing aircraft or helicopters on nonscheduled air carrier routes, aerial services such as air tours and other specialized aviation missions. In the context of natural and working lands, specialized missions include aerial seeding or reforestation, fire management, vegetation or rangeland mapping, or deployment of supplies or personnel to remote forest, shrubland, or grassland sites. Contributes to natural climate solutions by enabling monitoring, restoration, or wildfire response across landscapes. Excludes regional, national, and international airline pilots.

Oregon employment:
699

Projected employment (2033):
783

Annual average openings:
92

Commonly known as: Bush Pilot, Captain, Charter Pilot, Check Airman, Helicopter Pilot, Pilot
Relevant natural and working lands: Cropland, forest/shrubland, grassland/rangeland
Examples of relevant natural climate solutions: Fire management, grassland restoration, nutrient management, reduced degradation, reforestation[1]

Education/Training

Typical entry-level education: Associate degree
Competitive education: Bachelor's degree
Examples of certifications/licenses: Aerial Applicator License (Oregon Department of Agriculture), Commercial Pilot Certificate (Federal Aviation Administration)

Skills and Knowledge

Skill examples	Helpful training
Aerial applicaton	Oregon Aerial Pesticide Applicator certification to spray herbicide/ fertilizer
Aerial surveying	Collaborate with monitoring teams for aerial photography or data collection
Bush flying	Field experience conducting remote equipment and material drops
Precision flying	Field experience in flying precise, low-elevation, controlled patterns
Weather assessment	Interpreting fog patterns, wind shifts, and wildfire smoke conditions

[1]See NCS literature review

Created: 2025-12-03

Questions? Email AskEnergy@oregon.gov

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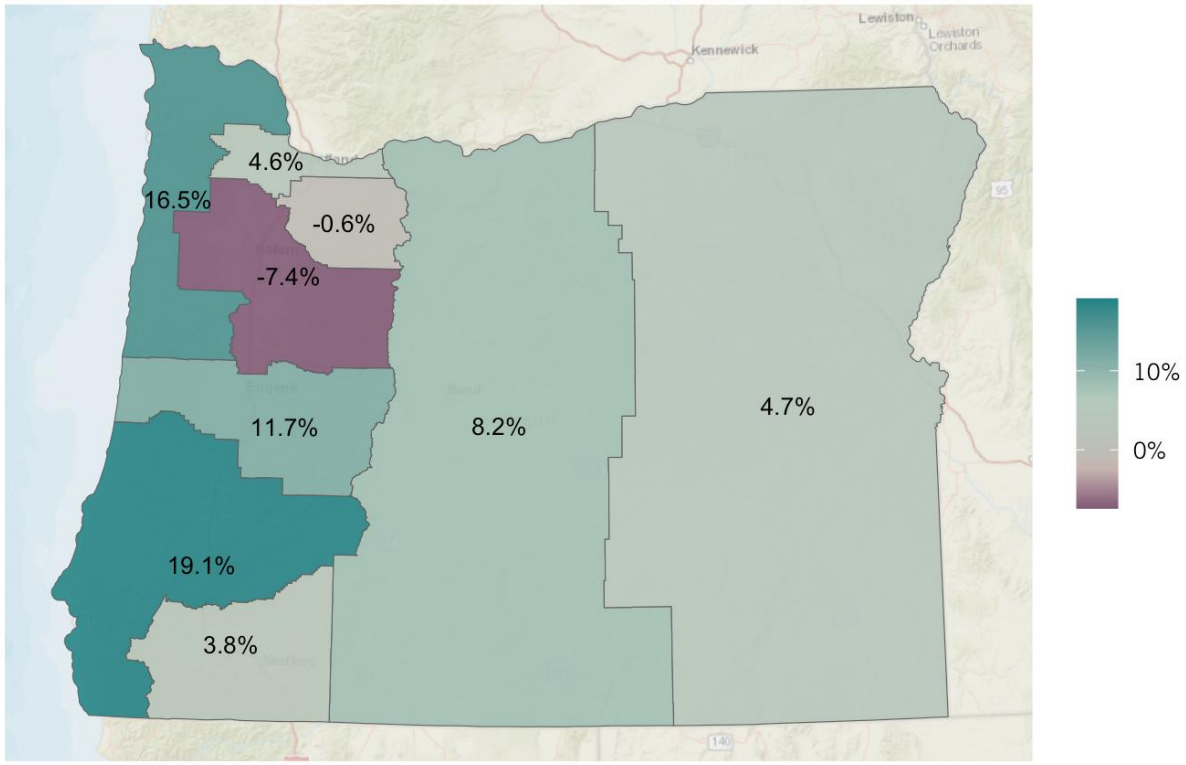
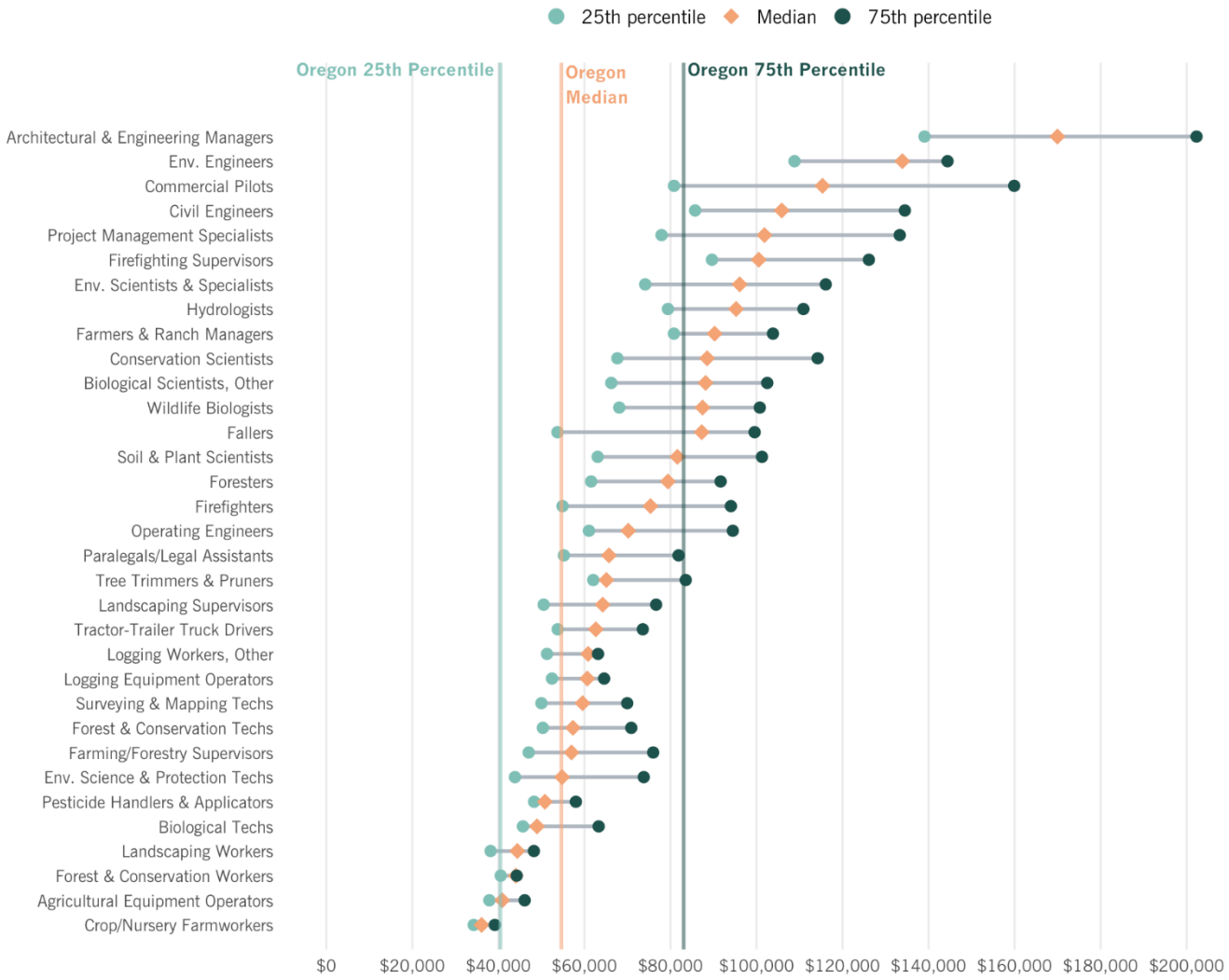
APPENDIX F: WORKFORCE ASSESSMENT SUPPLEMENTARY FIGURES

Figure 1: Difference Between NCS and Regional Average Pay Per Employee, 2023



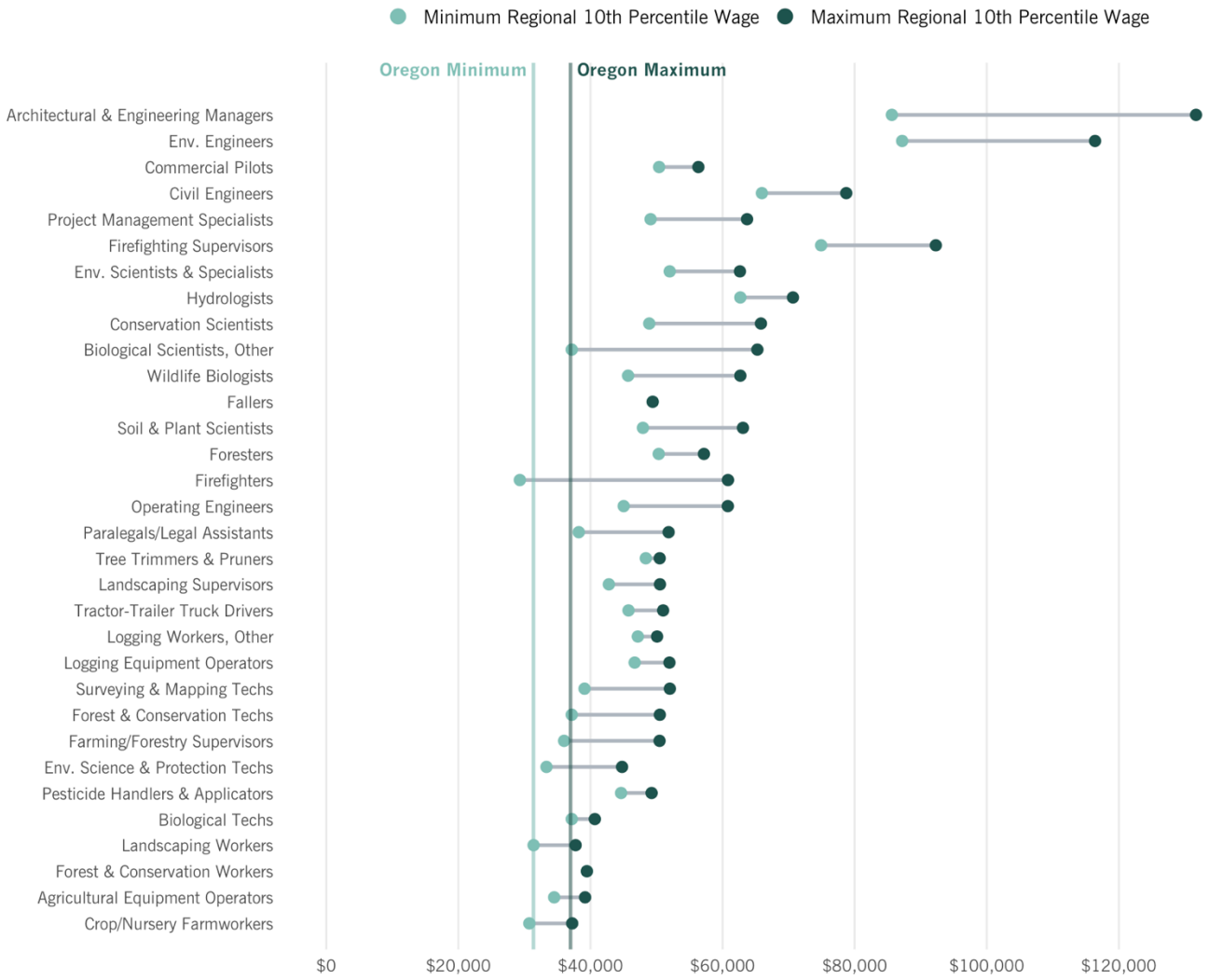
Data source: Oregon Employment Department, QCEW, 2023

Figure 2: Wage Distribution for Key NCS Occupations, Oregon, 2024



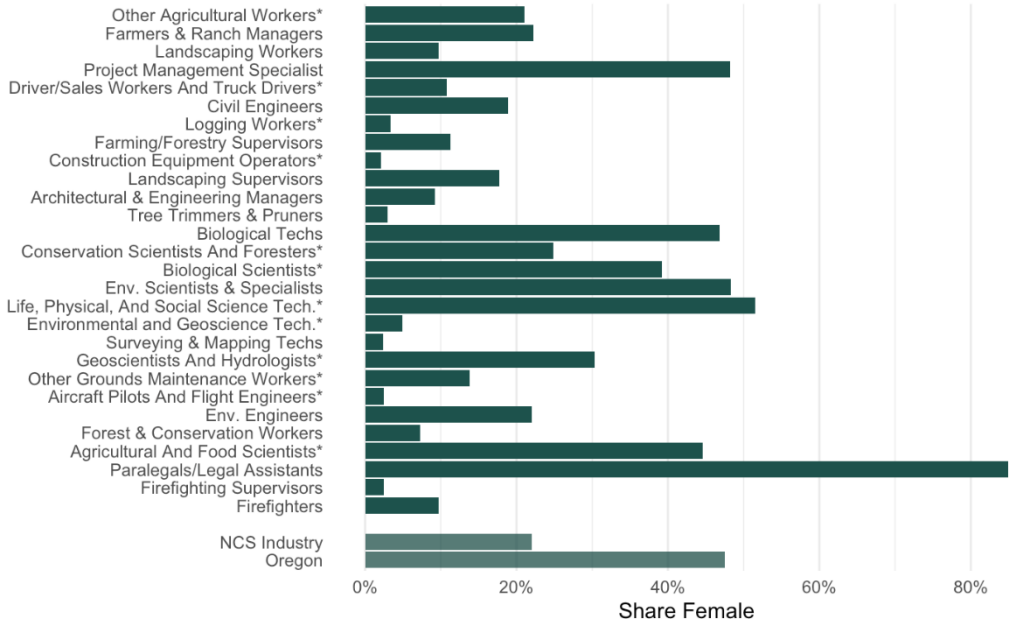
Data source: Oregon Wage Information, OED 2024.

Figure 3: 10th-Percentile Wages for Key NCS Occupations, by Region, Oregon, 2024



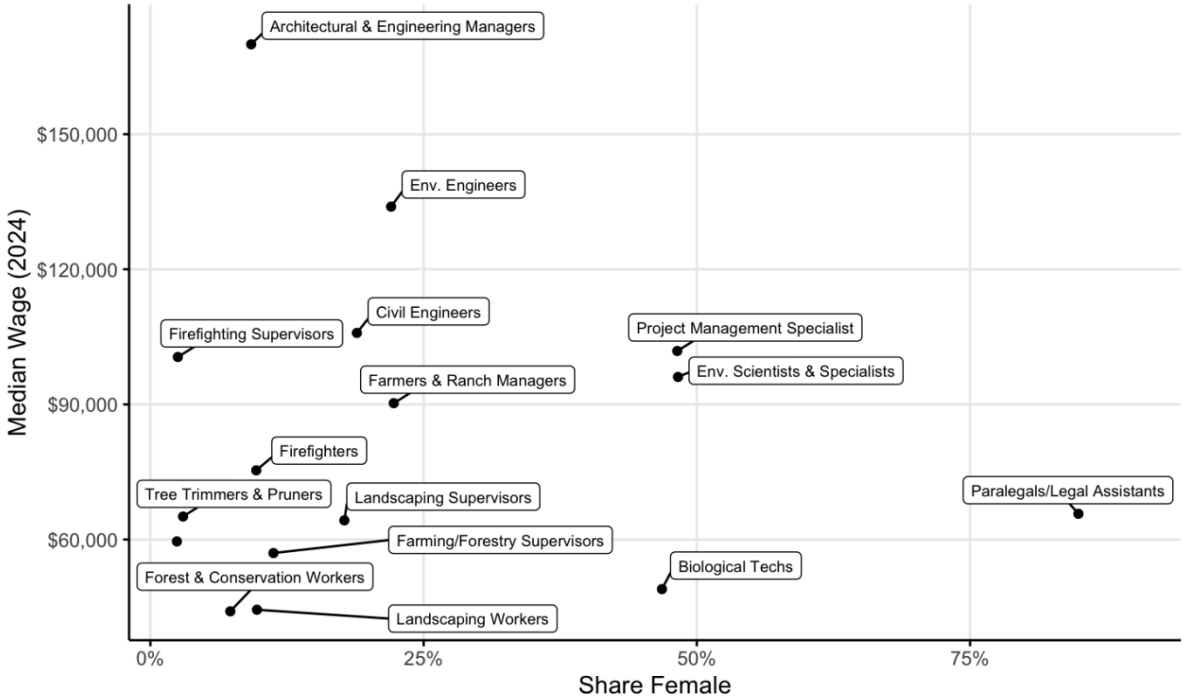
Data source: Oregon Wage Information, OED 2024. Note: Occupations are ordered by median wage, highest to lowest.

Figure 4: Share of Workers that are Female, Key NCS Occupations, Oregon



Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Notes: Occupations are ordered by number of employees in NCS industries (largest to smallest). Occupations with an asterisk (*) are those that have different formal titles in ACS data or are a combination of more than one occupation depicted in **Figure 13.**

Figure 5: Median Wage by Share of NCS Occupation's Workers that are Female, Oregon



Data source: U.S. Census Bureau (2023) American Community Survey, 5-year PUMS. Oregon Wage Information, OED 2024.

APPENDIX G: NCS WORKFORCE DEVELOPMENT AND TRAINING PROGRAM LIST AND EXAMPLE PROFILE

The following is a partial list of the workforce development and training programs that the consultant team profiled and which will be submitted in January 2026. The full list of profiles is forthcoming. The consultant team requested that representatives from these programs complete a survey to share specific data; not all programs could be reached during the project period.

- Antfarm Youth Services YouthCore
- COIC Youth Compass and Career Connect Programs
- Ecotrust Green Workforce Academy
- Friends of Tryon Creek Green Leaders
- Integral Youth Services Work2Learn
- Mt. Adams Institute Vets Work and Land Stewards
- Oregon Conservation Corps
- Oregon Natural Desert Association (ONDA) Tribal Stewards Program
- Oregon Youth Corps (OYC) Tribal Youth Workforce Partnerships

Below is an example Program Profile:

Program: Oregon Natural Desert Association Tribal Stewards Program

Topic	Content
Related NCS	Indigenous Traditional Ecological and Cultural Knowledge (ITECK), planting, fuel removal, opportunistic/nonnative plant removal, stream shading.
Related Land Sector	Grassland/Rangeland, Wetland, Forest/Shrubland
Location	Bend, OR In-person
Program Description	The program provides paid opportunities for Tribal and Indigenous youth and young adults to gain professional experience in the conservation field while working on culturally informed ecological restoration projects in Oregon's high desert.
Curriculum	An immersive field-based program that emphasizes the integration of Indigenous Knowledge with conservation practices based on Western science. Participants work on projects that bolster the health of the region's lands, waters and wildlife. Participants learn about career pathways in natural resource management, while visits with Tribal elders and community leaders provide important cultural context.
Cost to Enroll	$0

Topic	Content
Enrollment In 2025	7
Graduates In 2025	7
Placements In last 5 years	Not available
Relationship to NCS	The program trains young people who seek more opportunities to steward their ancestral lands, prepares them for careers in conservation, and promotes Tribal self-sufficiency in managing land-based projects.
Credential or Degree Awarded	None.
Related Occupations	Restoration technician, conservation technician, wildland firefighter, ecological forester, biological science technician, conservation crew supervisor.
Eligibility and Prerequisites	None.
Populations Served	Indigenous/Tribal young adults, with a focus on Tribal Nations in Central/Eastern Oregon.
Placement Tracking	Data not available.
Space Availability	1-2 spaces available at time of reporting.
Program Frequency	One cohort annually.
Supportive Services	Hourly wage and mobilization-related lodging, transportation, and food stipend.

References: Self-reported via survey, self-reported via interview, https://onda.org/tribal-stewards/, https://onda.org/indigenous-youth-in-conservation/. Last updated 11/23/2025.

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