TO: Columbia River Gorge Commission

FROM: Sage Ebel, Vital Signs Program Manager, Columbia River Gorge Commission

DATE: May 12, 2026

RE: **Vital Signs Monitoring Program Annual Report**

Purpose

This report summarizes the key findings and accomplishments of the Vital Signs Monitoring Program over the last year. While monitoring continues on all 17 vital signs in the program, this update focuses specifically on agriculture, economic vitality, and cold-water refuges. The Vital Signs Data Hub that launched in July of 2025 serves as the primary reporting platform for the remaining 14 vital signs, providing detailed analyses of the indicator data, topic background, and resources.

Vital Sign Program Background and Overview

The Vital Signs Monitoring Program evaluates the health of the National Scenic Area (NSA). Through long-term monitoring and data analysis, the program provides scientifically credible insights to staff and commissioners with the overarching goal of better understanding how the Management Plan protects resources and supports the economy of the National Scenic Area. This work relies on collaboration with the USDA Forest Service, local counties, the Columbia River Treaty Tribes, and other key partners.

While the program was originally envisioned in 2007, budget challenges halted progress until a revitalization effort began in 2021. The Commission approved a final list of 17 Vital Signs and 31 Indicators to move to implementation in December 2023. This year represents the first time since the 1992 Management Plan directed the Commission to develop such an evaluation program that staff have been able to perform a deeper level of evaluation on the health of the Columbia River Gorge NSA.

Detailed history, including the program's 2007 origins and the selection criteria for current indicators, is available in the March 2025 Staff Report and presentation, and the July 2025 Data Hub Overview.

If you are unfamiliar with the program or the list of indicators, please review those resources before continuing with this report.

A Word On Data

Each of the datasets that contributed to the analysis presented herein have limitations. There is inherent error associated with each dataset that is impossible to eliminate entirely. For a more

thorough discussion on the known error associated with each dataset please visit the corresponding Vital Sign Data Hub page. For a brief overview of error in scientific analysis please see the Vital Signs Data Hub presentation to the Commission in July of 2025 (minute 40-59 in Commission-Meeting-Video-3-2025.07.08.mp4)

Additionally, the indicator and supplementary data can only tell part of the story of what is, and in most cases we cannot define true causal relationships from these analyses. Staff and commissioners should use these findings as a tool and a foundation for further inquiry and continued monitoring.

2025/2026 Focus

While staff continue to support ongoing monitoring across all 17 Vital Signs, limited staff resources necessitate a prioritized approach. Staff have prioritized current capacity on supporting climate change action plan goals and on three vital signs: agriculture, economic vitality, and cold-water refuges. These topics were selected because they involve critical questions directly related to the upcoming Management Plan update. By performing deeper evaluations now, we are setting a scientific and technical foundation to inform the future decision-making processes.

A summary of the key findings for these priority topics is included below.

Agriculture

To perform a full analysis of the agriculture vital sign we are guided by the following questions:

- **Where is agriculture land in the NSA?** We will determine this through evaluation of current indicators.
- **How is agriculture land being used?** We will determine this through evaluation of current indicators, and we are exploring ground truthing options to hear from more agricultural producers in the NSA.
- **What is the economic impact?** We are working with the staff at the NASS to evaluate census of agriculture data.

These questions are the foundation that will allow us to do an informed review of the Management Plan policies to assure protection of agricultural lands and practices.

Current Indicator Evaluation

The agriculture indicators were developed to evaluate the current and past extent, distribution, and type of agricultural use in the National Scenic Area. We have performed this initial evaluation using the cropland dataset developed by the National Agricultural Statistics Service. This spatial dataset is available at a 30m resolution from 2014 to 2024. More details on this dataset as well as its limitations are available on the agriculture vital sign page.

In 2024 there was 7,725 acres of cultivated agricultural land and 74,088 acres of grasslands and pastures in the National Scenic Area. While these data cannot differentiate between working pasturelands and non-working grasslands, 80% percent of the area identified as pasturelands are also designated under the agricultural land use designations in the Management Plan suggesting these areas require continued protection as working lands.

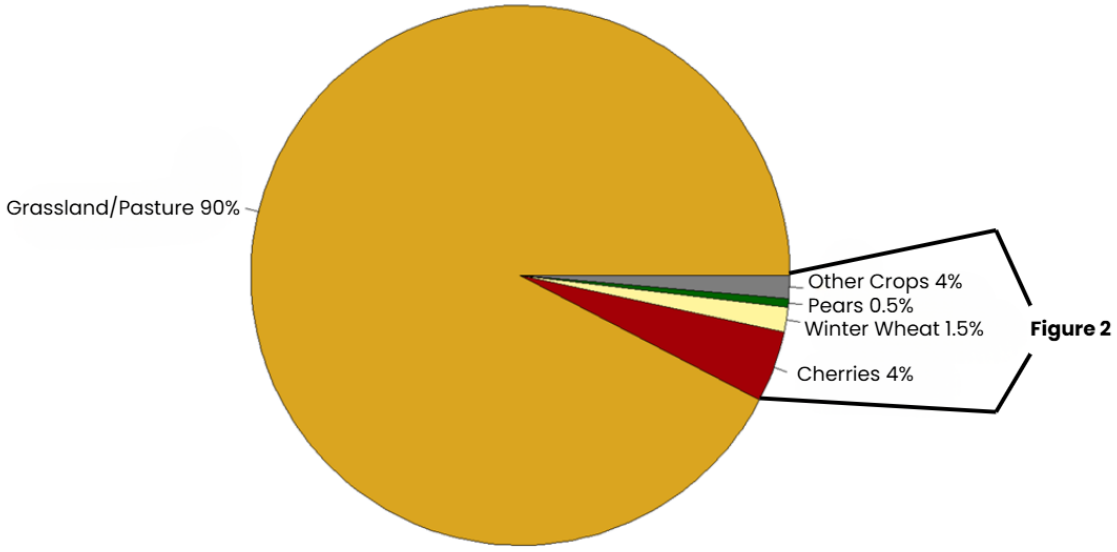

Figure 1: Distribution of land cover types in agricultural lands in the National Scenic Area by acre in 2024.

Crop Types

Excluding pasturelands, cherries make up nearly half (43%) of the cropland in the NSA by area in 2024. Most cherries are produced in Wasco County (86%). (Figure 2). Despite sharing a similar climate to Wasco County, Klickitat produces less cherries and has most of its agricultural land in pastures with over 50% of the total pastureland residing within the county.

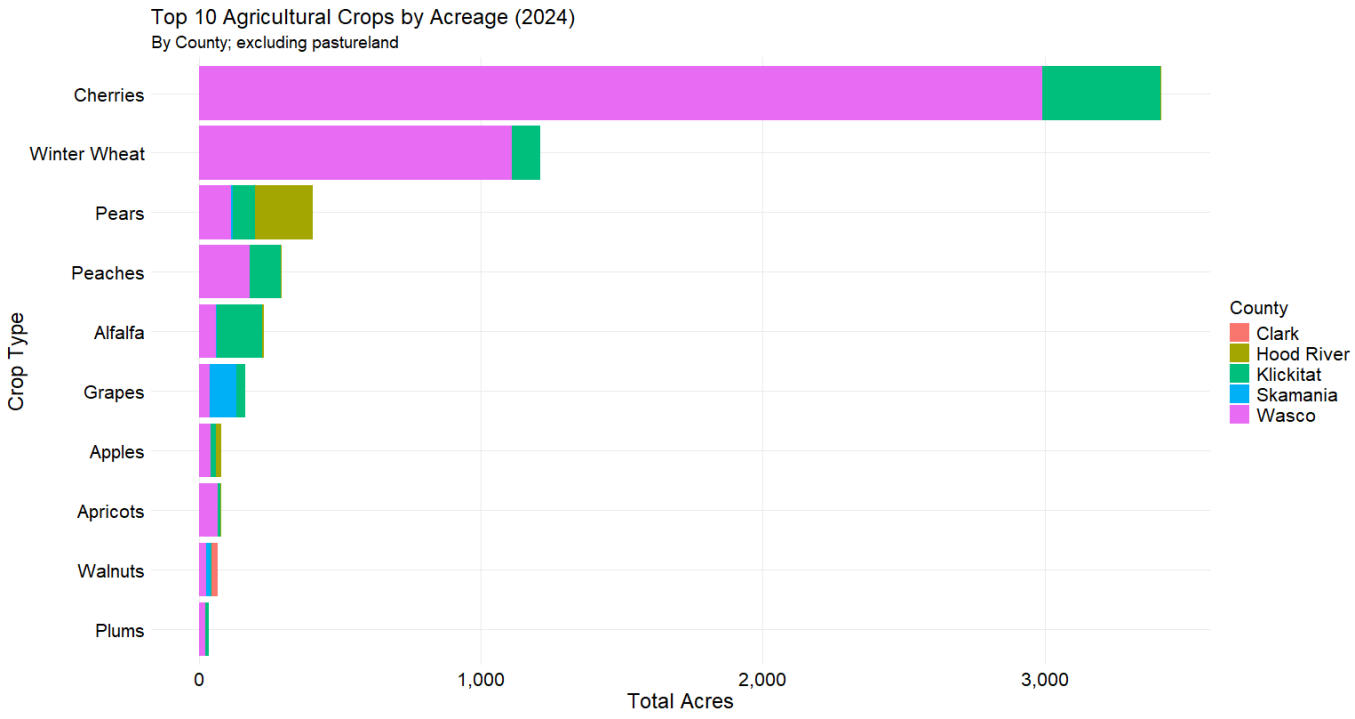

Figure 2: Distribution of cultivated land cover types in agricultural lands in the National Scenic Area by acre in 2024.

Trends Over Time

To evaluate how agricultural land use is changing over time, we performed a change analysis on the top 7 cultivated crops and pasturelands in the NSA. The total area of agricultural land has not experienced a statistically significant change since 2014. Of the top 7 crops cultivated in the National Scenic Area, only grapes and apples have experienced a statistically significant change in area (acres) over the last 10 years. On average, approximately, 30 more acres of vineyards, and 17 more acres of apple orchards are being planted annually.

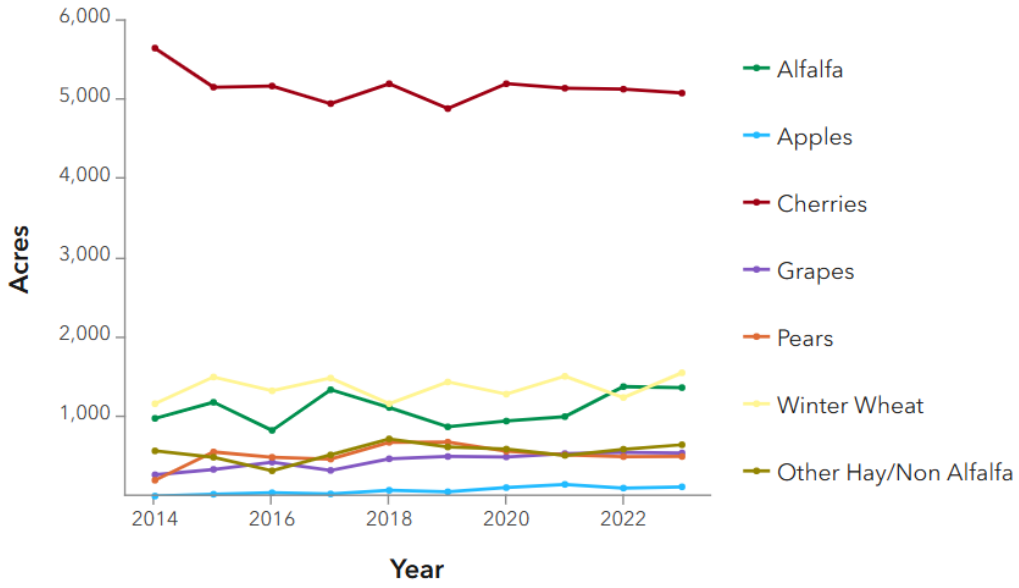

Figure 2: Change in crop area in cultivated lands for top 7 crops produced in the National Scenic Area between 2014 and 2023.

Economic Impact Analysis

Staff is using a multi-step approach to determine how agriculture impacts the local economy. First, we reviewed the Census of Agriculture data at the county level for 2017 and 2021 (the most recent report). A summary of our findings is included below, and figures are provided as supplementary materials at the end of this report.

Of the six NSA counties, Wasco and Klickitat have the most land being used for agriculture (including grazing) (Figure S1). Multnomah and Hood River counties have most of their agricultural land in crop production, while Wasco has most land in pastures. The other counties have a relatively even split in agricultural land use (crops, pasture, other, woodland) (Figure S2). Agricultural crops comprise most sales in all counties besides Skamania. Despite most land being in pasture, most agricultural sales in Wasco and Klickitat counties come from crops (Figure S3). All counties experienced a net increase in market value of agricultural products between 2017 and 2021. These increases are reflected in the net farm income in all counties besides Klickitat. The Clark and Skamania County net farm income is negative or $0. (Figure S4). Counties with less farmland and a higher proportion of that land in crop production earn more per acre than those with more pastureland. More land is required to earn the same profit in eastern counties where grazing is more common. (Figure S5).

Next Steps

Due to the data collection methodology these data cannot be clipped to the NSA boundary at this time, but we are synthesizing these regional findings with the localized Cropscape land-use data summarized earlier in this report. By comparing the extent, distribution and types of agricultural use within the NSA over the last 10 years to those at the county level we can begin to extrapolate the economic contributions of agriculture within the NSA acknowledging that the agricultural landscape within the NSA in some of these counties differs greatly from that outside of the NSA boundary.

We are establishing a baseline understanding of agriculture use in the NSA to understand how the Management Plan has changed the agriculture industry, but there are limitations to what we can learn from these data. We know that conditions on the ground may differ from what we see in the data and are exploring ways of surveying landowners and agricultural workers to get a human perspective to supplement our work. We will continue to collect and summarize data to understand these impacts and then evaluate our findings against policies in the Management Plan with the eventual goal of determining if policy changes are required to meet the intent of protecting and enhancing working lands within the NSA.

Economic Vitality

Evaluation of current indicators:

The economic vitality indicators reflect a key contribution from the Columbia River Gorge Commission to the NSA economy. By tracking the distribution and type of Oregon Investment Boar and Washington Investment Board loans and the economic benefit of these loans to local businesses we can understand where the loan program is having the biggest impact and where we might look to increase awareness and utilization of this program.

Since its initiation $17.4 million have been lent out through the revolving loan fund with 1,526 jobs created or retained through the program (through 2025). Total loan dollars lent annually range from a low in the 1994 of $8,500 to a high of $1.42 million in 2002. The average loan amount over the life of the program is $55,480. Skamania, Wasco, and Hood River County recipients have received the most loan dollars. The sectors that have received the most total loan dollars have been service, restaurant, and governmental sectors.

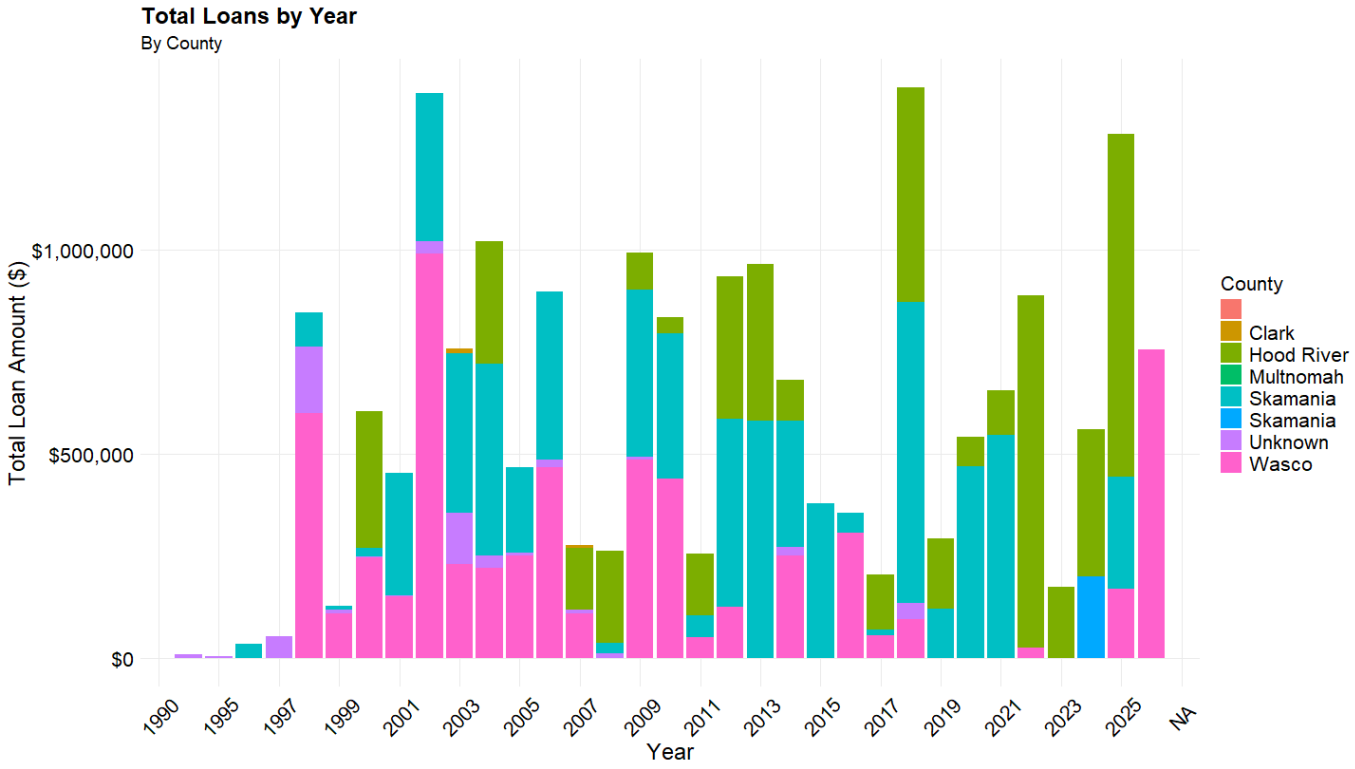

Figure 3. Total loan dollars per year in the National Scenic Area separated by county.

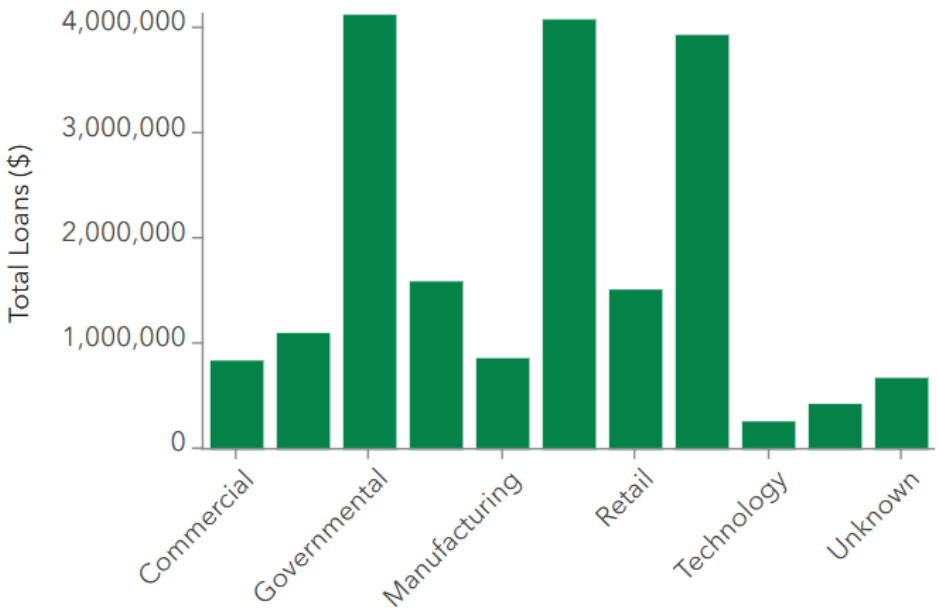

Figure 5. Total loan dollars by sector in the National Scenic Area.

Job creation through the loan program has followed similar patterns to the loan amounts with the loan program creating the most jobs in 2002 at 254. Most jobs have been created in the restaurant industry with each restaurant industry loan creating 10 jobs on average. The most jobs have been created in Skamania County where residents take good advantage of this loan program for a wide variety of business endeavors.

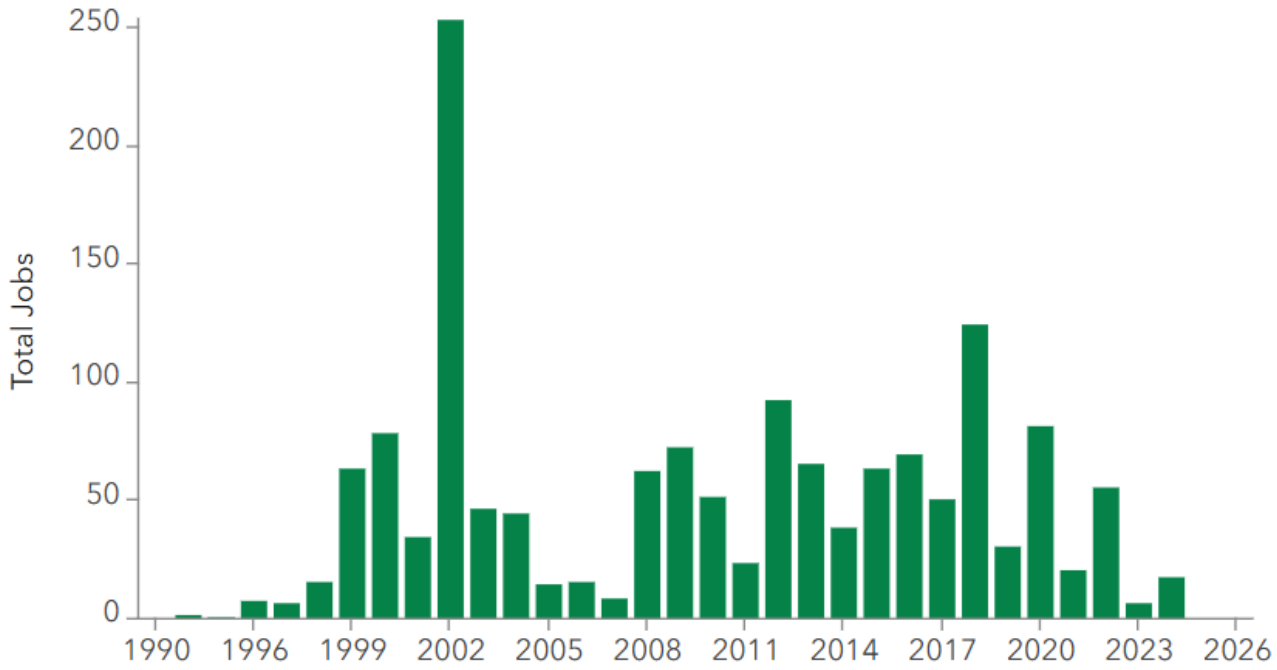

Figure 6. Total jobs created per year through the loan program.

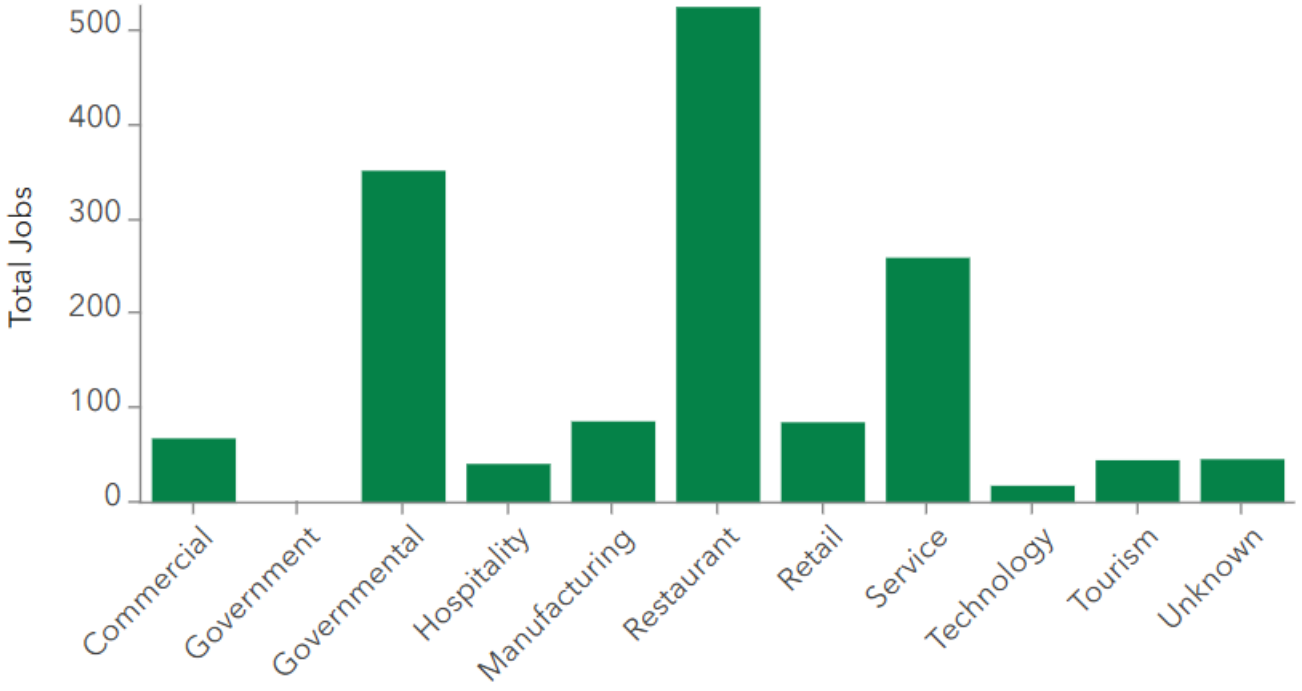

Figure 8. Total jobs created in each industry sector.

Additional Economic Datasets for Evaluation

Staff have begun analyses of additional economic data provided by the United States Census Bureau. Through collaboration with the Washington State regional economic office, we have clipped census data to the National Scenic Area boundary and have begun to summarize resident and transient worker trends including job type, location, and pay as well as demographic information over the last 20 years.

Cold Water Refuges

Evaluation of current indicators:

We are monitoring the temperature and flow of the 10 cold water refuges (CWRs) within the NSA (where data are available). These rivers are vital resting locations for migrating salmon that use the cold-water pockets that form at the confluence with the mainstem of the Columbia River on their migration upstream to their spawning habitat.

The cold-water refuge rivers were originally defined in the 2021 Columbia River Cold Water Refuges Plan. The criteria for inclusion in the list were that the average modeled August water temperature must be 2 degrees C colder than the main stem of the Columbia River and the flow had to be more than 10 cubic feet per second. The 2020 Management Plan implemented 200-foot buffers around these rivers in response to the EPA report.

Since the EPA report was published, we have been able to support the installation of several monitoring locations to supplement the modeled data developed for the report, and the support the ongoing monitoring effort required to understand how land use, the Management Plan, and climate change are impacting these important habitats. We are still working with our partners to complete the monitoring network. A summary of available data is included below as table 1. If data are available, the data provider is listed.

Table 1. Status of Temperature and Flow Monitoring on the CWRs in the NSA.

Cold Water Refuge	Temperature	Flow
Sandy River	USGS	USGS
Tanner Creek	USDA Forest Service	
Eagle Creek	USDA Forest Service	
Herman Creek	USDA Forest Service	
Wind River	USGS	USGS
Little White Salmon River	Fish and Wildlife Service/Little White Salmon National Fish Hatchery	Fish and Wildlife Service*
White Salmon River	USGS	USGS
Hood River		USGS
Klickitat River		USGS
Deschutes River	USGS	USGS

**Not enough data available yet for distribution, but monitoring is underway.*

Temperature

We are most interested in the highest temperatures of the CWRs, which typically occur in late summer when the flows are the lowest. This time coincides with the migration of fish up the Columbia River.

We have evaluated several metrics to understand how the temperature in the CWRs has changed over time. Average and maximum august temperatures have remained steady over the investigation period in 5 of the 7 CWRs where we have enough data available to perform a trend analysis. Tanner and Herman Creek are experiencing small, but significant temperature increases, but remain well within the limit to constitute designation as a CWR. The Columbia River mainstem

average and maximum August temperature is above 20 degrees C (the water quality standard for the Lower Columbia River in WA and OR) every year in the period of record and is increasing. To see a comparison of the average and maximum daily stream temperatures visit the cold water refuges vital sign page.

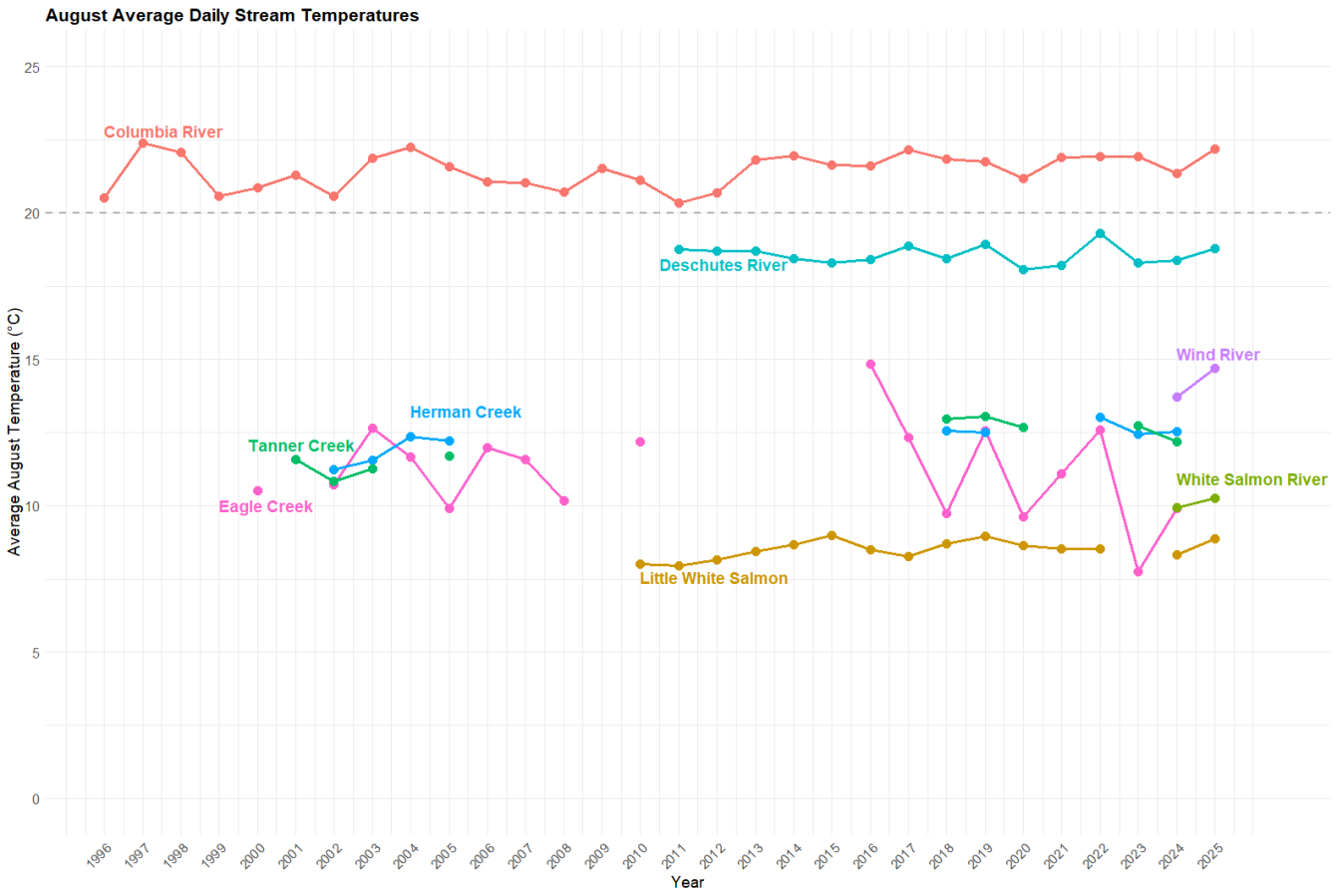

Figure 9. Average August daily stream temperatures with the Columbia River Water Quality standard displayed as a grey dashed line. Lines between points are for clarity only and do not represent a trend.

We evaluated the number of days each summer (June 1 – Sep 30) that each of the CWRs and the Columbia River mainstem experienced water temperatures above 20 degrees C and found that the number of days that the mainstem is above 20 degrees is increasing annually. No other CWRs had days above 20 degrees C except for the Deschutes River, which had days above 20 degrees C every year for the period of record. While the number of days above 20 degrees C in the Deschutes is not increasing, we question it's present utility as a CWR. Activities on the mainstem of the Columbia including dam operations, heat waste discharge and climate warming are increasing the temperatures and subsequent stress on these culturally and environmentally essential species. The CWRs are more important than ever to protect.

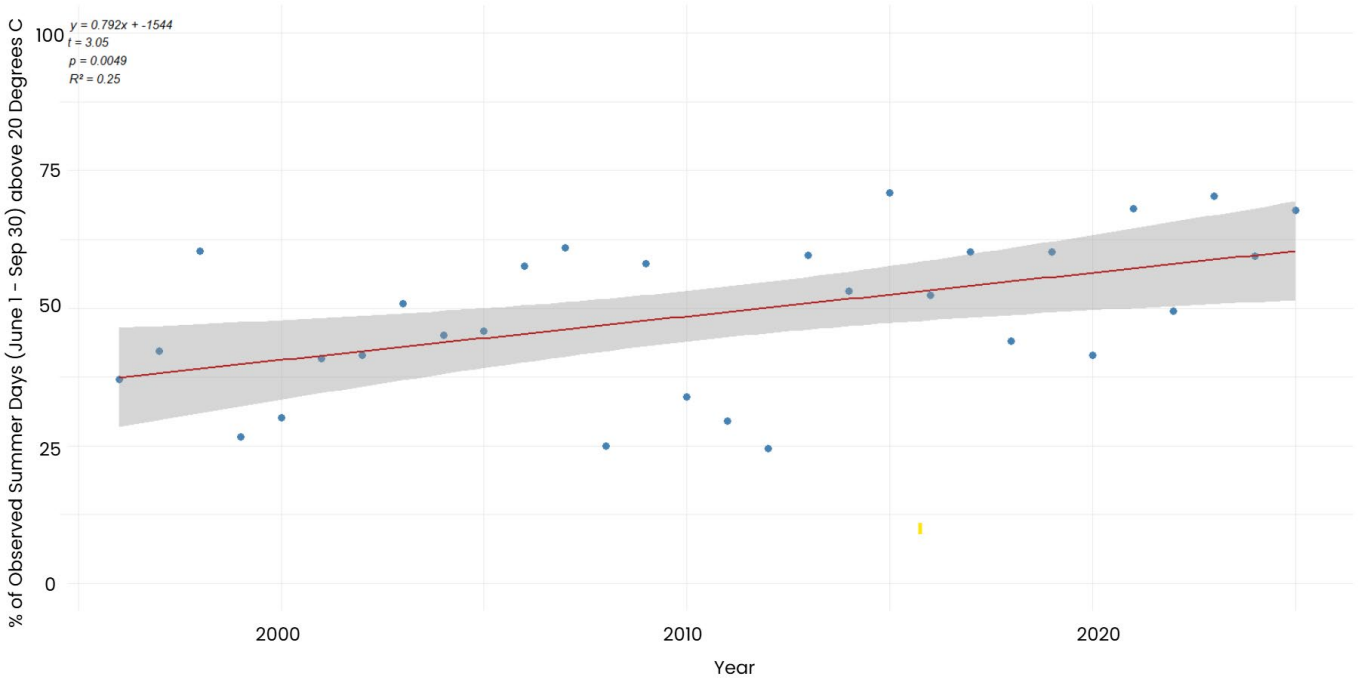

Figure 10. Columbia River mainstem percent of observed summer days with water temperatures above 20 degrees C. A linear model was fit to the data and is shown in red, with grey shading representing the 95% confidence interval. The linear trend equation is displayed in the top left of the figure.

Flow

Mean august stream flows range from ~200 cfs in small rivers like the Hood River to ~5,000 cfs in larger rivers like the Deschutes. We observed no statistically significant change in August mean stream flow across the period of record for the CRWs where we have available stream flow data. While the loss of seasonal snow and changing precipitation regimes in the region are influencing annual and spring flows, the utility of the CWRs remains intact from a flow perspective.

Next Steps

We are evaluating our findings against the Management Plan and working to identify existing and potential policies to continue to protect the CWRs and working to support the reduction of temperature increases on the mainstem where possible.

Conclusion

The findings in this report are the first step in a long-term look at the health of the National Scenic Area. We will use this data to try to answer a key question: Is our Management Plan working as intended?

Each indicator was chosen because it links directly to the Management Plan. However, measuring success is not always simple. Like a human body, the National Scenic Area is a complex system affected by many outside forces ranging from climate change, to the actions of other agencies. In some cases, our goal is to separate those outside factors from the direct influence of our policies to understand their impact alone. In others, we may wish to evaluate the system as a whole, including the impacts from changing conditions. Both perspectives will work together to provide the scientific foundation we need to keep our plan relevant and responsive to a changing environment and economy.

Supplemental Materials

The census of agriculture data that is summarized below is self reported from agricultural producers. These data are not clipped to the NSA and thus represent conditions at the county level. Conditions within the NSA will likely differ from the conditions presented from this analysis.

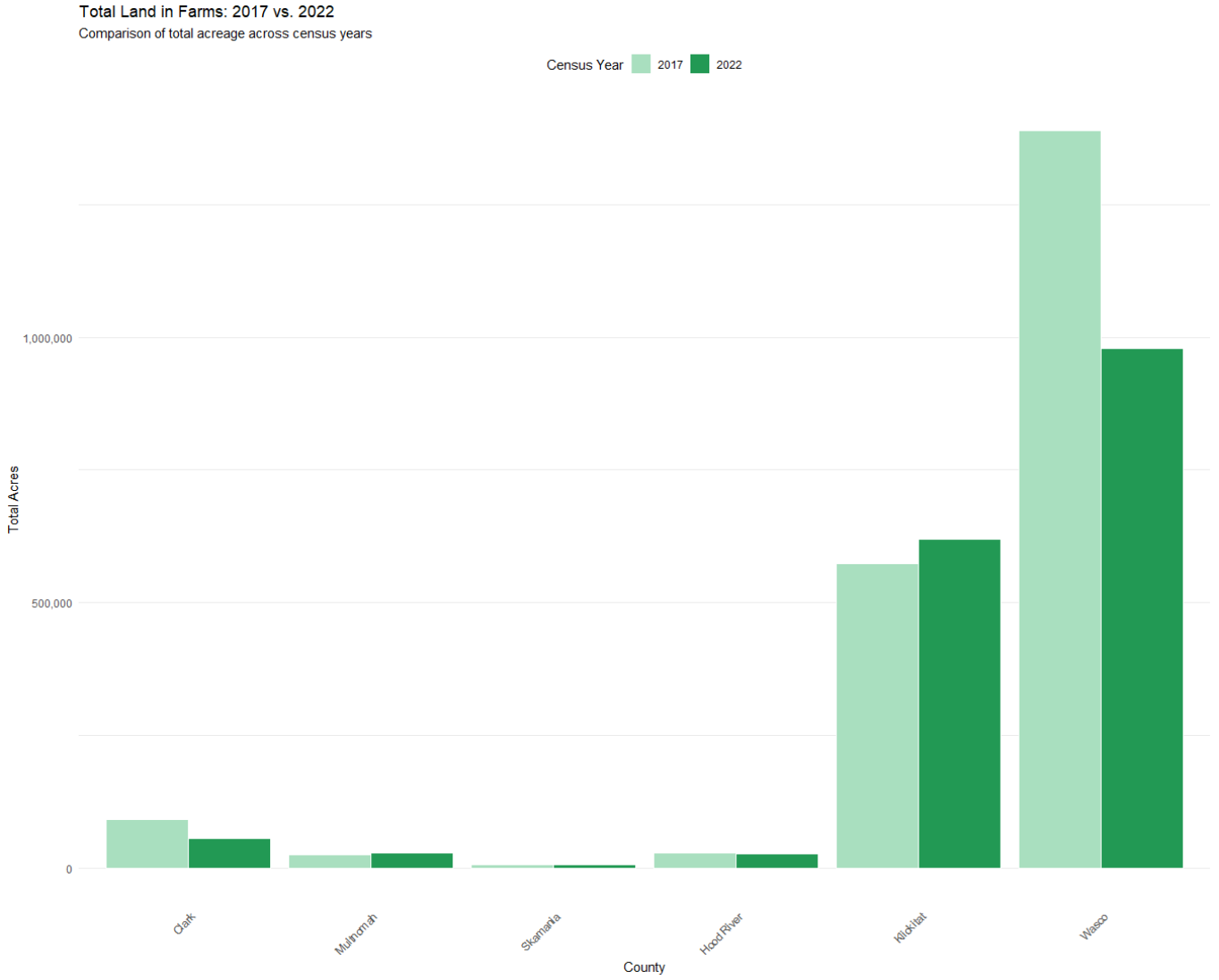

Figure S1. Total acres of agricultural land report by the census of agriculture for each of the six NSA counties. These data are for the entire county and not clipped to the NSA.

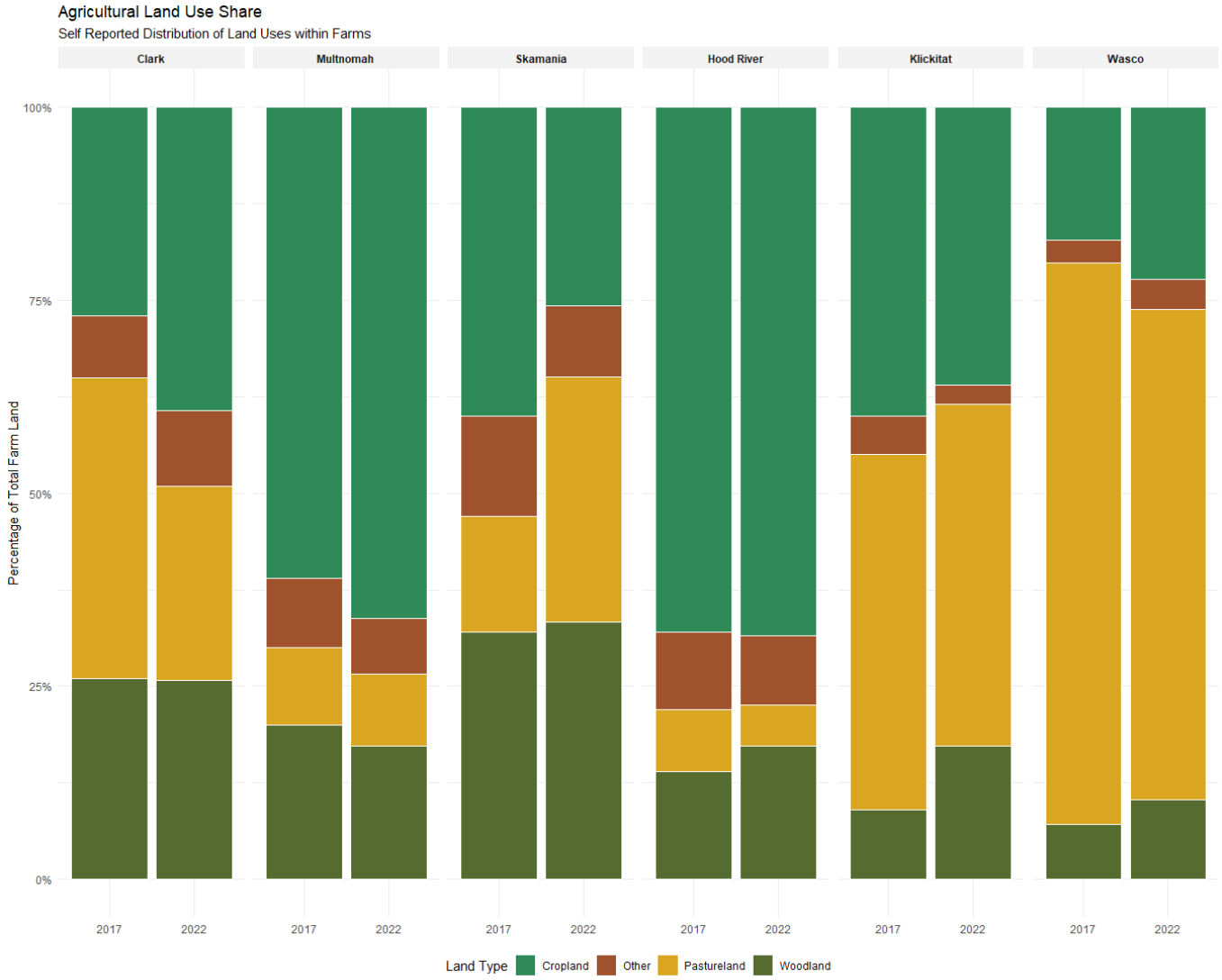

Figure S2. Agricultural land use share by county from the census of agriculture for 2017 and 2022. These data are not clipped to the NSA.

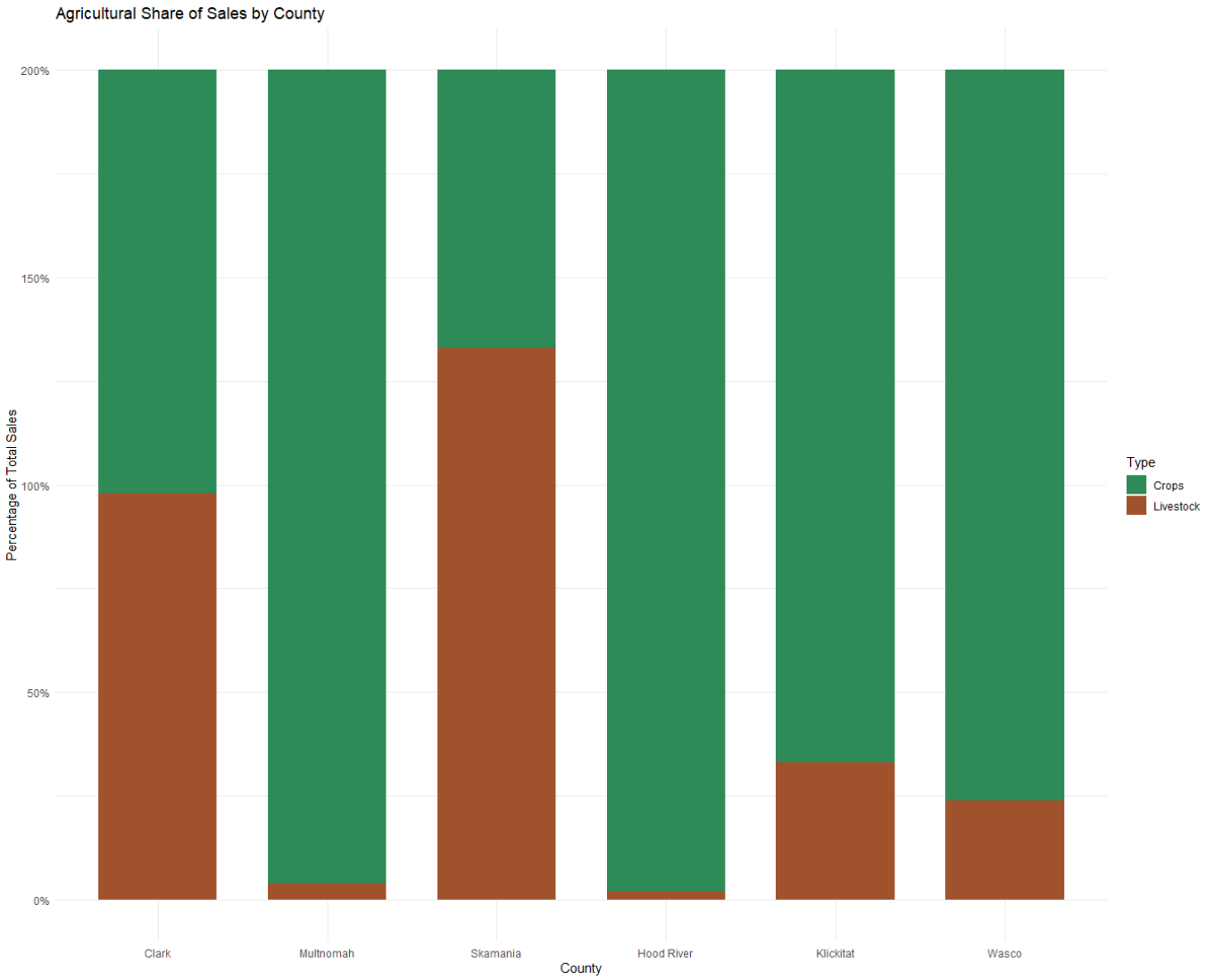

Figure S3. Percentage of total agricultural sales from crops vs. livestock in each of the counties in 2022. These data are not clipped to the NSA.

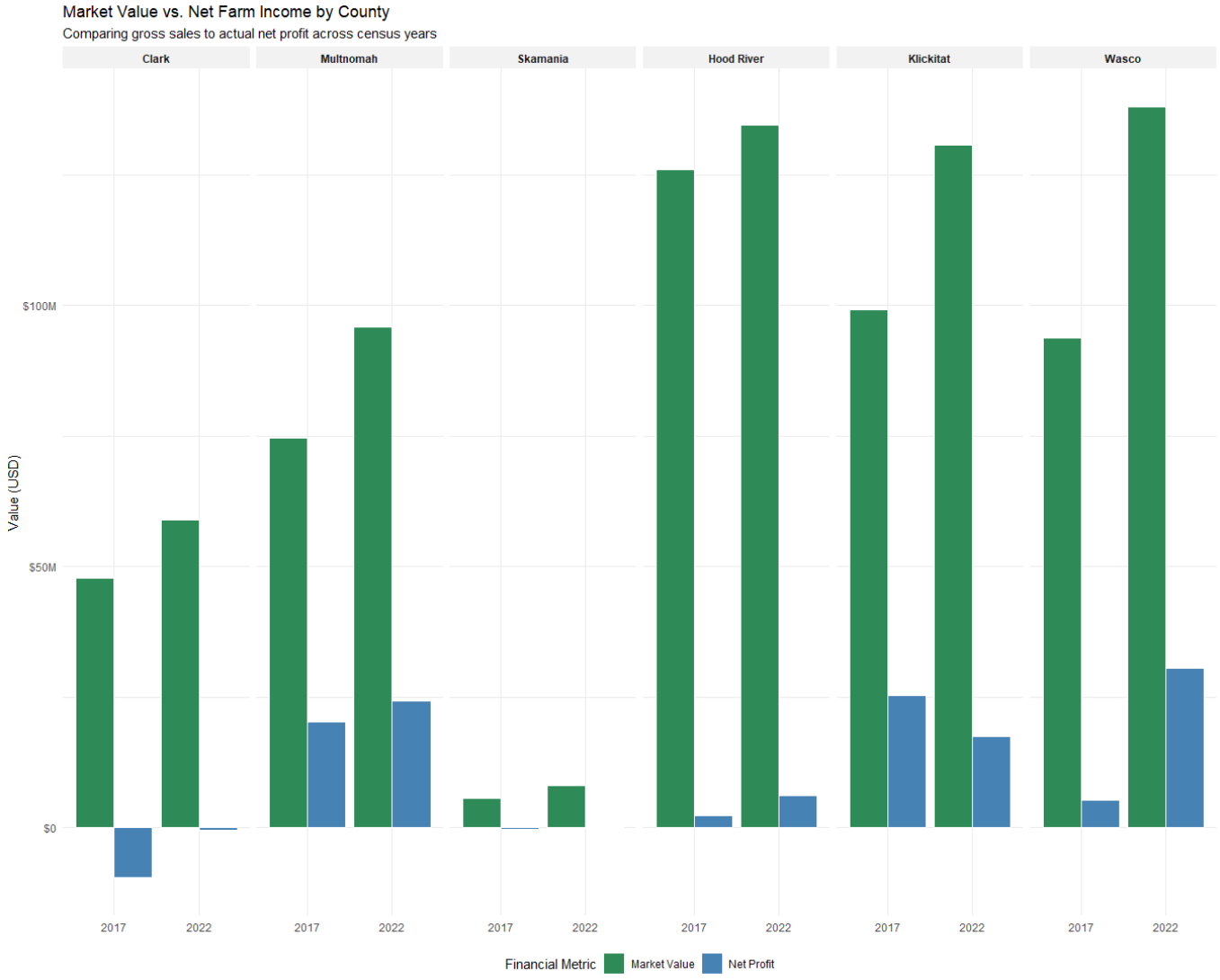

Figure S4. The market value of agricultural products (crops and livestock) and the total net profit of each county.

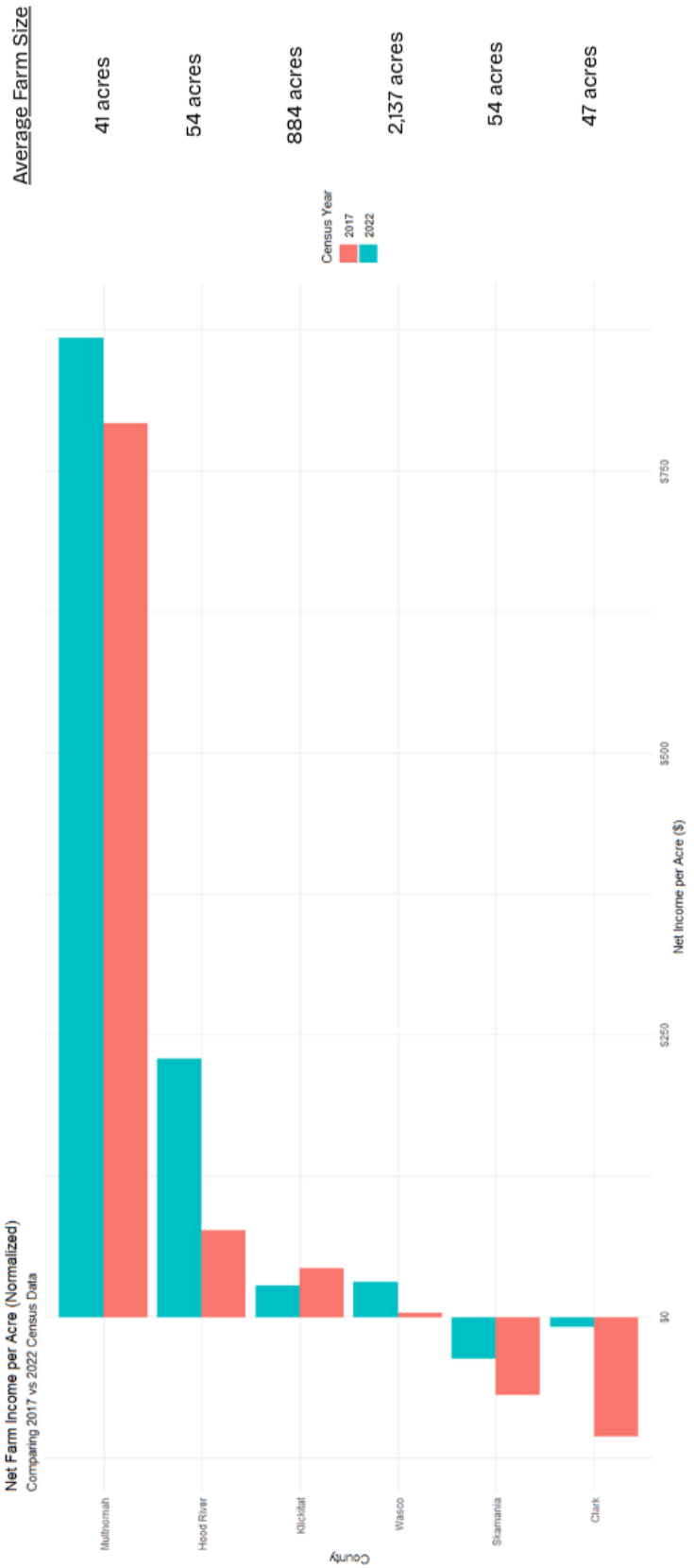

Figure S5. Net farm income by county. Average farm size is listed on the far right of the figure.