**TO:** Columbia River Gorge Commission

**FROM:** Lisa Naas Cook, VSI Planner, Columbia River Gorge Commission
Casey Gatz, Resources and Planning Staff Officer, Forest Service

**DATE:** December 14, 2021

**RE:** **Work Session*:** Vital Sign Indicators Program: Progress Report for Draft Natural Resource and Climate Change Indicators

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**Purpose**

This report provides an overview of the draft indicators developed for the Draft Priority Natural Resource and Climate Change Vital Signs described in the June 2021 VSI Staff Report. A summary of the VSI update process is included to ensure that Commissioners have background information on how draft indicators were selected.

**Contents of this Report**



## I. Summary of Natural Resource and Climate Change Indicator Development Process

The Vital Sign Indicators (VSI) program evaluates the long-term health of scenic, natural, cultural, and recreation resources, and local economies, of the Columbia River Gorge National Scenic Area (CRGNSA). Vital Sign Indicators are high-level measures that guide assessment of progress toward Management Plan goals. Building on the original 2009 VSI effort, the Commission and Forest Service initiated work on a comprehensive VSI update in 2021 that integrates climate change impacts as a key consideration in developing indicators. The first phase of this update focused on natural resource and climate-focused indicators, given the interconnected and foundational nature of these topics for all other protected resources and economies in the CRGNSA. This timing also

provided the opportunity to integrate climate vulnerability assessment information and priority climate adaptation and mitigation topics from the Commission's Climate Change Action Plan (CCAP) effort with the indicator development process.

**A. Main Steps of VSI Update Process** (See Appendix A for definitions of monitoring program terminology used in this report.)

- **Identify key management questions**: Starting with the 2009 VSI list of natural resource indicators, staff compiled key management questions and possible Vital Sign topics based on review of the Gorge 2020 Management Plan revision process, informational interviews conducted for the VSI Assessment, and a staff work session completed in December 2020. (See Appendix D for details on how the draft natural resource indicators in this report connect with the original 2009 indicators.)

- **Select priority Vital Signs**: In the spring of 2021, staff convened a VSI Technical Work Group of natural resource and monitoring specialists from tribes, agencies, and organizations (e.g., U.S. Forest Service, U.S. Geological Survey, Yakama Nation Fisheries, East Cascades Oak Partnership, and others) to review management questions and possible Vital Signs. Staff and the work group narrowed down the initial list of priority habitats and protected resources in the Management Plan through an iterative process considering several factors including agency opportunity to affect resource condition, land use stressors, climate change impacts, and connection with culturally important species and First Foods. In June 2021, staff presented this draft list of Vital Signs for Commission review and discussion. (See the June 2021 VSI Natural Resource and Climate Change Progress Report for details on the rationale for each Vital Sign.)

- **Develop indicators**: Based on Commission and public feedback at the June 2021 meeting, staff has been working with the VSI Technical Work Group and other resource specialists to identify potential indicators for each Vital Sign. The following feasibility-focused criteria, approved by the Commission in February 2021, were used to guide indicator selection:

  1. **Measurable**: Indicators should be directly measurable through repeatable quantitative or qualitative methods.

  2. **Relevant to management actions**: Indicators should provide information on the condition of protected resources related to specific Management Plan provisions.

  3. **Clear**: Indicators should be understandable by the public and policymakers.

  4. **Consistently available**: Indicator data should be reliably available over time to track long-term status and trends.

  5. **Obtainable**: Indicator data should be available through existing monitoring programs whenever possible.

  6. **Cost-effective**: Indicator data acquisition, analysis, and reporting should make efficient use of limited financial and staff resources.

7. **Additional Consideration:** While criteria 1-6 should be the primary criteria for selecting indicators, the ability of indicators to tell a *compelling story* that calls attention to the status of scenic, natural, cultural, and recreation resources, and economies, of the National Scenic Area, should also be considered.

This report describes the draft natural resource and climate change indicators identified through this selection process. In addition, several key learnings, collaborations, and accomplishments of the past year are highlighted below.

**B. Key VSI Achievements in 2021**

- Collaborated with USFS Northwest Oregon Area Ecology Program ecologists to identify national and regional datasets for air quality and forest carbon storage.
- Established exploratory CWR monitoring working group with EPA, OR Department of Environmental Quality, and WA Department of Ecology.
- Coordinated with USGS Research Ecologist Erik Beever, PhD to improve understanding of pika and talus spatial information in the CRGNSA.
- Integrated East Cascades Oak Partnership (ECOP) oak distribution map in planner's tool and strengthened ongoing partnership to advance VSI and ECOP strategic plan monitoring goals in 2022-23.
- Learned about Fire Adapted Communities framework and built relationships with forest and community resilience organizations and agencies in the region.

## II. Draft Natural Resource and Climate Change Vital Sign Indicators

**A. Overarching Considerations:** The draft indicators described below reflect several fundamental considerations:

- The National Scenic Area is a complex, interconnected ecological and human system within a larger regional landscape. Vital Sign Indicators represent critical components of this system based on their connection to the Management Plan, however they do not capture all key attributes that could be monitored at various spatial and temporal scales.
- It is necessary to strike a balance between defining a VSI vision of what is needed in the long term and what is achievable in the short term.
- Establishing strong partnerships and demonstrating success with a focused and strategic set of indicators now establishes the solid foundation necessary on which to build into the future as additional funding and resources are available.
- Basic conceptual models (visual tools that show relationships among indicators, management responses, and human well-being and biophysical conditions) are valuable to understand how a selected indicator fits within the broader CRGNSA system. Staff has started working on a VSI conceptual model with the understanding that this can be further developed with additional funding and scientific collaboration.
- Identifying desired conditions, baseline conditions, and thresholds are valuable components of a long-term monitoring program and require considerable staff time and coordination with partners. During the past three months, staff has explored an approach to these concepts that could be integrated with indicator implementation. (See Appendix B for an

illustration with the Streams and Riparian Areas: Cold Water Refuge Salmon and Steelhead Habitat Vital Sign.)

### B. Summary of Indicator Selection Criteria Assessment Results

Staff reviewed all potential natural resource and climate change indicators to determine whether each met these criteria: (1) Measurable, (2) Relevant to management actions, (3) Clear, (4) Consistently available, (5) Obtainable, (6) Cost-effective, and (7) Additional consideration: compelling story. Each potential indicator was assigned a value: 1 (Yes) or 0 (No) for each criterion. If information was unavailable to determine a clear Yes/No answer, a 0 value was used.

The table in Appendix C groups potential indicators into three implementation feasibility categories based on their selection criteria rankings:

- **High** feasibility indicators (met 6-7 criteria) have data available now through existing monitoring programs or data sources.
- **Medium** feasibility indicators (met 4-5 criteria) generally reflect that partial data is available, funding is uncertain, or more work is needed to develop the indicator.
- **Low** feasibility indicators (met 2-3 criteria) are generally those that require considerable work and/or funding to develop condition-based metrics.

This summary table also crosswalks how potential natural resource and climate change indicators support priorities in the Climate Change Action Plan and connect with other Vital Sign focus areas including scenic resources, recreation, cultural resources, and economic vitality.

Based on indicator selection criteria rankings, input from the VSI Technical Work Group, and learnings from other regional monitoring programs, staff suggest a phased approach to natural resource and climate change monitoring.

- First, focus on landscape condition indicators with available spatial data (extent and distribution of priority habitats) by building a comprehensive land cover layer that can be used to track land cover change over time. The new database will support this work by allowing staff to query, for example, the spatial extent, number, and type of approved projects in the NSA occurring in a particular habitat type over a specified period (e.g., new vineyards in oak woodlands from 2022-2027).
- Next, continue working with partners to develop data for other priority indicators with partial data available (e.g., CWR stream temperature and flow) and those requiring additional work and funding (e.g., ECOP oak condition assessment tool).

### C. Recommended Draft Natural Resource and Climate Change Vital Sign Indicators

The table below provides brief descriptions of **recommended draft indicators** for Draft Vital Signs described in the June 2021 VSI Staff Report with the following changes:

- **Culturally Important and Rare Plants Vital Sign:** Given the lack of comprehensive data available to implement a rare plants occurrence indicator at this time, staff suggest focusing on culturally important plants, some of which are also considered rare, through consultation with Tribes. More work on culturally important plants will coincide with development of cultural resource indicators in 2022. Staff will also continue to work with USFS and state

heritage programs to explore which plant species could be prioritized to improve the implementation feasibility of this indicator.

- **Coniferous Forests:** Based on input during the June 2021 Commission meeting, staff recommends adding Coniferous Forests as a Natural Resource Vital Sign. Like several other Vital Signs in this report, Coniferous Forests are both a priority habitat and a scenic landscape setting in the Management Plan. Suggested indicators are included in the table below.
- **Talus:** Staff recommends adding Talus as a Natural Resource Vital Sign and includes draft indicators in the table below. Talus is a priority habitat in the Management Plan and serves as refugia for habitat specialist species such as the pika and Larch Mountain salamander in the face of climate change.

Staff are currently working with resource and monitoring specialists to determine the most appropriate metric for each indicator below.

| Management Plan Goal | Vital Sign | Draft Indicator | Description and Status |
|---|---|---|---|
| Ensure that new uses do not adversely affect Priority Habitats or sensitive wildlife sites. | Coniferous Forests | Extent and Distribution | This indicator measures the total acreage and spatial distribution of coniferous forests in the CRGNSA. Work is underway on a coniferous forest land cover spatial data layer. |
| | | Land Cover Change | This indicator tracks the spatial distribution and percent change in coniferous forest cover at a specified interval corresponding with currently available land cover database updates. |
| Ensure that new uses do not adversely affect Priority Habitats or sensitive wildlife sites. | Grasslands/ Prairies | Extent and Distribution | This indicator measures the total acreage and spatial distribution of grasslands in the CRGNSA. Work is underway on a grassland land cover spatial data layer. |
| | | Land Cover Change | This indicator tracks the spatial distribution and percent change in grassland cover at a specified interval corresponding with currently available land cover database updates. |
| Ensure that new uses do not adversely affect Priority Habitats or sensitive wildlife sites.<br><br>Develop a comprehensive program to inventory existing oak woodlands and propose methods for their protection, including incentives for property | Oregon White Oak Woodlands | Current Extent and Distribution | This indicator measures the total acreage and spatial distribution of oak woodlands in the CRGNSA. Currently, no comprehensive oak land cover layer is available for this region. A modeled oak distribution map developed by East Cascades Oak Partnership and aerial imagery will be used to estimate current extent and distribution. Reporting for this indicator beyond current estimate depends on future model update and ground truthing the current map through monitoring (see below). |

| Management Plan Goal | Vital Sign | Draft Indicator | Description and Status |
|---|---|---|---|
| owner cooperation and support, acquisition of sensitive stands, and easements to preserve the oaks on large parcels. | | Land Cover Change | This indicator tracks the spatial distribution and percent change in oak woodland cover at a specified interval corresponding with currently available land cover database updates. Anticipate determining the model update frequency when ECOP develops a monitoring plan in 2022-2023. Expect model update may be in 2028-2029 to coincide with USFS Forest Inventory and Analysis (FIA) plot data collection frequency (10 years) used for this map. ECOP plans to make minor adjustments to the map in the short term as disturbance and condition monitoring tools are deployed over the next few years. |
| Achieve no loss of wetlands acreage and functions.<br><br>Improve the quality of wetlands. | Wetlands | Extent and Distribution | This indicator measures the total acreage and spatial distribution of wetland habitat in the CRGNSA. Work is underway on a wetland land cover spatial data layer. |
| | | Land Cover Change | This indicator tracks the spatial distribution and percent change in wetland cover at a specified interval corresponding with currently available land cover database updates. |
| Protect water quality, natural drainage, and fish and wildlife habitat of streams, ponds, lakes, and riparian areas.<br><br>As part of long-term National Scenic Area monitoring, encourage federal and state agencies and others to undertake a comprehensive water quality monitoring program on the Columbia River and its major tributaries. | Streams & Riparian Areas: Cold Water Refuge (CWR) Salmon and Steelhead Habitat | Stream Temperature | This indicator measures stream temperature on 10 CWR tributaries in CRGNSA included in EPA Columbia River Total Maximum Daily Load (TMDL) Temperature Plan. From work with partners to date, staff has identified active temperature monitoring on 7 of the 10 CWR streams. |
| | | Stream Flow | This indicator measures stream flow on 10 CWR tributaries in CRGNSA included in EPA Columbia River TMDL Temperature Plan. From work with partners to date, staff has identified active flow gauges on 5 of the 10 CWR streams. |
| Ensure that new uses do not adversely affect Priority Habitats or sensitive wildlife sites. | Talus | Moss Cover | This indicator assesses moss cover at select talus sites in the CRGNSA. Staff are determining availability of high-resolution aerial imagery for this indicator. To be implemented by USFS. |
| | | Temperature | This indicator measures temperature at the base of select talus fields in the CRGNSA. Indicator under development. To be implemented by USFS. |
| Air quality shall be protected and enhanced, consistent with the | Air Quality | Visibility | This indicator measures the number of days per year with visibility impairment. Also measures chemical composition of fine |

| Management Plan Goal | Vital Sign | Draft Indicator | Description and Status |
|---|---|---|---|
| purposes of the National Scenic Area Act.<br><br>Coordinate with federal and state agencies on air quality and visibility in the National Scenic Area and utilize the results of such monitoring in developing and updating the regional air quality protection and enhancement strategy described in SMA Natural Resources Wildlife and Plants Policy 15 (Part I, Chapter 3: Natural Resources). | | | particulates (<2.5 um diameter). Data available through USFS. |
| | | Precipitation Chemistry | This indicator measures the amounts of acid, nitrates, and sulfates deposited to the environment in precipitation. Data available through USFS. |
| | | Terrestrial Effects of Pollution & Climate Change | This indicator measures spatial distributions and levels of 27 pollutants accumulated in sensitive vegetation. Lichen-based air quality and climate scores are used to understand where pollution is above safe thresholds for pollution sensitive vegetation and where climate is driving changes in sensitive vegetation. Data available through USFS. |
| Provide information on Firewise guidelines to landowners.<br><br>Prohibit new dwellings on Commercial Forest and Large Woodland.<br><br>Encourage the use of forest management and fire, as appropriate, to restore and perpetuate natural ecosystems. | Wildfire | Wildfire Extent & Distribution | This indicator tracks the acres burned per year by wildfire in the CRGNSA. Spatial distribution of wildfire can be examined across Land Use Designations, Priority Habitats, and other protected resources. |
| | | Fuels Reduction (NFS Lands) | This indicator reports the acres of fuels reduction completed per year on National Forest System (NFS) lands in CRGNSA. Includes both thinning and prescribed fire. |
| | | Fuels Reduction (All Lands) | This indicator reports the acres of fuels reduction completed per year across land ownership in CRGNSA. Currently, some federal, state, and private fuels reduction projects are tracked in both WA and OR, though one comprehensive dataset for the CRGNSA does not exist. |

## D. Climate Change Indicator Priorities

The following are potential climate change indicator topics that reflect CCAP mitigation emphasis areas under development. Below are staff recommendations based on review of available data and feasibility considerations captured in the indicator selection rankings (see Appendix C for details).

**Wildfire** – The CCAP recognizes the importance of wildfire as a climate change hazard posing risks to scenic, cultural, natural, and recreation resources, as well as carbon stores and viable working lands. This report includes three potential wildfire-related indicators: wildfire extent/distribution, fuels reduction on NFS lands, and fuels reduction across land ownership in the CRGNSA. These indicators help tell the story of wildfire as a climate hazard in forests and other habitat types as well as a gorge-wide climate concern affecting all partners, residents, and visitors. The first two indicators are well-developed and easily reported on now, while the third is one staff feels can be at least partially reported on and would like to continue pursuing. Partners have shared that spatially tracking fuels reduction across land ownership (all lands) is valuable in seeking funding that often prioritizes adjacency of proposed projects to existing treatments on the landscape. Staff

recommends starting with wildfire extent/distribution and fuels reduction on NFS lands as wildfire indicators, while continuing to work with partners to acquire data for an all-lands fuels reduction indicator.

**Carbon storage** – Staff has investigated several methods to estimate carbon storage of different land cover and habitat types (e.g., forests, grasslands, agricultural lands, and wetlands) and determined that the best candidates still require further work and capacity. We understand several agencies in both Oregon and Washington are working on carbon tracking as federal and state funds become available for climate smart forestry and climate smart agriculture. Staff recommends beginning with the first step of creating a detailed land cover data layer (also a necessary first step in developing several natural resources indicators). When that product is complete, the Commission can reassess capacity and need for additional carbon storage assessment work.

**Transportation** – Early in developing the CCAP, staff recognized that transportation accounts for a large portion of GHG emissions in both Oregon and Washington. For that reason, we explored options for a transportation indicator. There are some well-established metrics for evaluating transportation efficiency, such as Vehicle Miles Traveled. Through consulting with partners, staff determined that more work is needed to identify which metrics would be useful based on transportation-related climate mitigation actions included in the Draft CCAP to be released in early 2022. Staff would like to hear Commissioners' thoughts about their interests in long-term monitoring related to transportation. The current staff recommendation is to table a transportation-related indicator for this biennium given the amount of work that would be needed without additional resources.

## III. Next Steps for Indicator Development and Implementation

- Review of other regional monitoring programs reveals the importance of creating conceptual models which are visual tools that show relationships among indicators, management responses, and human wellbeing and biophysical conditions. Staff will continue working on a VSI conceptual model.
- Staff will continue to explore developing desired conditions, baseline conditions, and thresholds through an iterative process after Vital Sign Indicators are developed and approved.
- Based on the approved 2022 Commission Priorities Work Plan, staff will develop indicators for scenic resources, recreation, economic vitality, and cultural resources in phases with the goal of a comprehensive set of draft indicators by the end of 2022.

## IV. Topics for Commission Consideration

(1) Does the Commission support moving forward with the recommended natural resource and climate change indicators in **green** in the summary table on pages 5-7 of this report?

(2) Does the Commission support moving forward with staff recommendations for wildfire, carbon storage, and transportation topics as described on pages 7-8 of this report?

## Appendix A: Definitions

**Management Plan Goal:** A goal included in the text of the Columbia River Gorge National Scenic Area Management Plan.

**Desired Condition:** To be developed. (Example: Often a statement of aspiration that describes resource conditions the USFS and CRGC strive to achieve and maintain to meet Management Plan goals.)

**Management Question:** A priority question or information need identified by the Gorge Commission and U.S. Forest Service to support implementing the Management Plan.

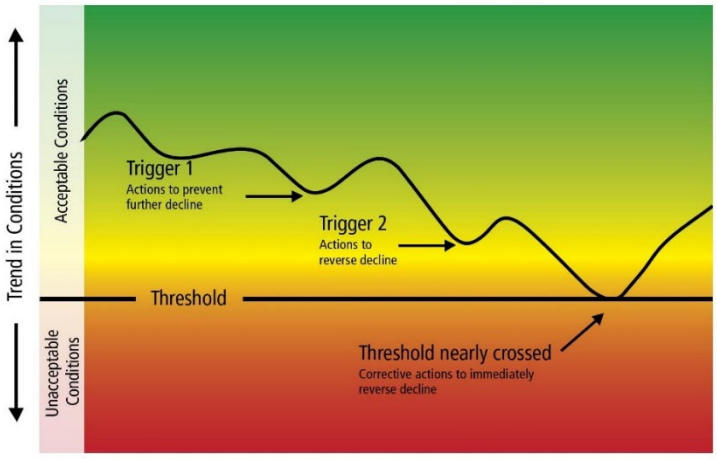
**Vital Sign:** The topic for a high-level indicator. Represents important attributes or components of protected resources that guide assessment of progress toward Management Plan goals and desired conditions (e.g., Streams and Riparian Areas). Each Vital Sign is represented by one or more indicators.

**Indicator:** A short description of what is being measured (e.g., stream flow).

**Metric:** The specific measurement method or unit of measurement for an indicator (e.g., mean annual flow).

**Threshold:** To be developed. (Example: A minimally acceptable condition associated with each indicator, typically based on physical, biological, or social conditions.)

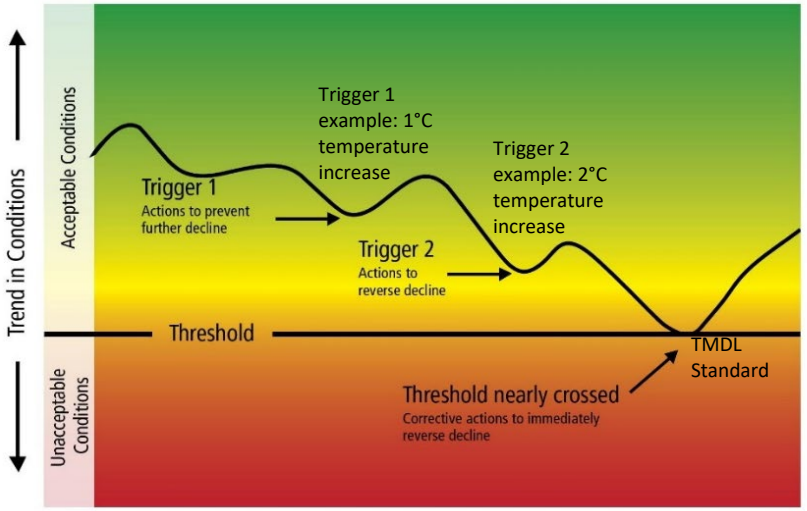
**Trigger:** To be developed. (Example: A condition of concern for an indicator that is enough to prompt a management response to ensure that desired conditions continue to be maintained before the threshold is crossed.)



## Appendix B: Example of Desired Condition, Baseline, Threshold, and Trigger Concepts for VSI Program

The chart below highlights one possible approach staff has explored to develop desired conditions, baseline conditions, thresholds, and triggers for different Vital Signs using Cold Water Refuge Salmon and Steelhead Habitat as an example.

The graphic to the right depicts how monitoring a particular habitat condition, such as stream temperature, can be used to prompt action before a threshold is crossed.




### Vital Sign: Streams and Riparian Areas: Cold Water Refuge Salmon and Steelhead Habitat

| **Management Plan Goal** | **Desired Condition** (To be developed) | **Management Questions** | **Draft Indicator** | **Baseline** (To be developed) | **Threshold** (To be developed) | **Trigger** (To be developed) |
|---|---|---|---|---|---|---|
| Protect water quality, natural drainage, and fish and wildlife habitat of streams, ponds, lakes, and riparian areas. | Streams in the CRGNSA that are cold enough to support salmonids.<br>Example of specific condition: Total Maximum Daily Load (TMDL) Temperature Maximum Target for Eagle Creek: 15.1°C (August mean 5-year avg) | How is water temperature changing in CWR streams in the CRGNSA over time?<br>Are 200' stream buffers helping to protect quality cold water refuge habitat for salmonids? | Stream temperature (e.g., maximum 7-day running average of daily maximum temp). | Establishment of CRGNSA (1986) as goal—to be determined based on available data. Historical temperature data varies by location.<br>Connect with EPA/DEQ/ECY management objectives. | Consult with EPA, DEQ, ECY, and others on Columbia River TMDL Water Quality Standards for CWR streams (e.g., 18°C 7DADM for Eagle Creek). | Consult with agencies to develop.<br>If primary CWR tributaries are defined as at least 2°C cooler than Columbia River, what level of increased temperature should prompt action? |

## Appendix C: Crosswalk of Potential Natural Resource and Climate Change Indicators with Other Protected Resources in the Management Plan

The chart below highlights how potential natural resource and climate change indicators reviewed in the selection process connect with other Vital Sign focus areas including scenic resources, recreation, cultural resources, and economic vitality. Indicators are grouped from most feasible (green) to least feasible (red) at the present time based on selection criteria described in this staff report. As a work in progress, this chart is not inclusive of all Management Plan implications; rather, it reflects connections to Draft Recreation and Scenic Vital Signs presented to the Commission in August 2021, as well as connections to culturally important species identified through work on CCAP and VSI to date.

Staff recognize the interconnected nature of many protected resources in the CRGNSA and anticipate that more overlap across Vital Signs will emerge as development of other indicators progresses.

| Vital Sign | Potential Indicators | Natural | Climate (Supports CCAP) | Scenic | Recreation | Cultural | Economic |
|---|---|---|---|---|---|---|---|
| Coniferous Forests | Extent and Distribution, Land Cover Change | ● | ● | ● | | ● | |
| Grasslands/Prairies | Extent and Distribution, Land Cover Change | ● | ● | ● | | ● | |
| Wetlands | Extent and Distribution, Land Cover Change | ● | ● | ● | | ● | |
| Air Quality | Visibility, Precipitation Chemistry, Terrestrial Effects of Pollution & Climate Change | ● | ● | ● | | | |
| Wildfire | Acres of fuels reduction per year on NFS lands in NSA (thinning and prescribed fire) | | ● | ● | | | |
| Wildfire | Acres burned per year by wildfire (including distribution) | | ● | ● | | | |
| Talus | Moss cover, Temperature (select sites by USFS) | ● | ● | | | | |
| Streams & Riparian Areas: CWR | Stream temperature, Flow* | ● | ● | ● | ● | ● | |
| Oregon White Oak Woodlands | Extent and Distribution | ● | ● | ● | | ● | |
| Streams & Riparian Areas: CWR | Salmon population abundance | ● | ● | ● | ● | ● | |
| Wildfire | Acres of fuels reduction per year across land ownership | | ● | ● | | | |
| Talus | Pika presence/absence (citizen science) | ● | ● | | | | |
| Talus | Pika evidence (Beever's methodology also includes moss cover, temp/RH, and microrefugial characteristics) | ● | ● | | | | |
| Oregon White Oak Woodlands | Land Cover Change | ● | ● | ● | | | |
| Oregon White Oak Woodlands | Condition (multiple measures of ecological integrity in assessment tool under development) | ● | ● | | | | |
| Carbon Storage | Carbon stock by land cover type - forest | | ● | | | | |
| Wildfire | Number of landowners/parcels in NSA incorporating Firewise principles | ● | ● | ● | | | |
| Culturally Important & Rare Plants | Occurrence | ● | ● | | | ● | |
| Grasslands/Praires | Condition (TBD) | ● | ● | ● | | | |
| Streams & Riparian Areas: CWR | Benthic macroinvertebrates | ● | ● | ● | | | |
| Oregon White Oak Woodland | Connectivity (overlay with deer and elk winter range) | ● | ● | ● | | | |
| Coniferous Forest | Condition (TBD) | ● | ● | ● | | | |
| Wetlands | Condition (TBD) (veg layer in progress) | ● | ● | ● | | | |
| Carbon Storage | Carbon stock by land cover type - wetlands, grasslands, and ag lands | | ● | | | | |

*Note: Currently, stream temperature and flow gauges are available on some CWR streams and not others. These indicators are included in "high" feasibility category to reflect that reporting is possible now on select streams.

## Appendix D: 2009 Natural Resource Vital Sign Indicators and 2021 Draft Natural Resource Vital Signs Cross-Walk Chart

This chart describes how the 2021 Draft Natural Resource Vital Sign Indicators highlighted in this report build upon the 2009 Natural Resource Vital Sign Indicators.

| 2009 Natural Resource Vital Sign Indicators | | | | | | | | 2021 Draft Natural Resource Vital Signs |
|---|---|---|---|---|---|---|---|---|
| **Objective** | **Vital Sign Number** | **Vital Sign Title** | **Measure** | **Proxy Measure** | **Year Reported** | **Connects to Management Plan Provision? YES/NO/UNCLEAR** | **Management Plan Reference & Notes** | |
| 2.1 Protect and Enhance the Native Plants and Animals and the Habitats Which Support Them | 2.1.a | Habitat Quality | Percent of priority habitat types rated as properly functioning | Number of important landscape elements in the Scenic Area that are functioning at high levels | 2009 | YES on Vital Sign; Review of measures needed | Part 1: Chapter 3, GMA Goal 1: "Ensure that new uses do not adversely affect Priority Habitats or sensitive wildlife sites." | **Terrestrial Habitat: Coniferous Forests Oregon White Oak Woodlands Grasslands/Prairies Talus** |
| | 2.1.b | Habitat Fragmentation | Percent of priority habitat types that are lost or fragmented by human activity | | TBD in 2011 | YES on Vital Sign because habitat fragmentation connects with habitat quality; Review of measures needed | See Habitat Quality reference above. Wildlife consult for development reviews includes assessment of habitat integrity. Connectivity is part of integrity. | |
| | 2.1.c | Species Health | Percent of at-risk species whose populations in the gorge are healthy | Note: In 2009, only reported on plants; no assessments of animal species available. | 2009 | YES on Vital Sign because species health connects with habitat quality; Review of measures needed | See Habitat Quality reference above for wildlife and Part 1: Chapter 3, GMA and SMA Goals for Rare Plants. (Note: This measure could apply to plants or wildlife.) | **Culturally Important and Rare Plants** |
| | 2.1.d | Species Range | Percent of native species (wildlife, plants, invertebrates) with ranges that are declining | | TBD in 2011 | YES on Vital Sign because species range connects with habitat quality; Review of measures needed | See Habitat Quality reference above for wildlife and Part 1: Chapter 3, GMA and SMA Goals for Rare Plants. (Note: This measure could apply to plants or wildlife.) | |
| 2.2 Protect and Enhance Quality of the Water and Aquatic Habitats | 2.2.a | Surface Water Quality | Percent of streams, including Columbia River, whose water quality is (a) poor, (b) fair, (c) good, and (d) excellent. | Number of watersheds, including the Columbia River, where water quality is (a) impaired and (b) good. | 2009 | YES on Vital Sign because water quality connects with aquatic habitat quality; Review of measures needed | Part 1: Chapter 3, GMA Goal 3: "Protect water quality, natural drainage, and fish and wildlife habitat of streams, ponds, lakes, and riparian areas." | **Water Resources and Aquatic Habitat: Streams and Riparian Areas--Cold Water Refuge Salmon & Steelhead Habitat Wetlands** |
| | 2.2.b | Habitat Quality | Percent of native **fish** habitat that is properly functioning | | 2009 | YES on Vital Sign; Review of measures needed | Part 1: Chapter 3, GMA Goal 3: "Protect water quality, natural drainage, and fish and wildlife habitat of streams, ponds, lakes, and riparian areas." | |
| | 2.2.c | Surface Water Quantity | Percent of streams with satisfactory in-stream flows | | TBD in 2011 | UNCLEAR | While the Commission does not manage for water quantity specifically, stream flow is critical for CWR fish species and is covered above. | |
| | 2.2.d | Groundwater Quantity | Square miles of groundwater restricted areas | | TBD in 2011 | NO | Currently, not Commission's role to regulate groundwater. Is there information we want to collect to inform consideration of a policy change in the future? | |
| | 2.2.e | Groundwater Quality | To be developed | | TBD in 2011 | NO | | |
| 2.3 Protect and Enhance Quality of the Air | 2.3.a | Air Quality | To be developed | | Summary in 2009 | YES on Vital Sign; Review of measures needed | Part I: Chapter 3, Wldlife and Plants, SMA Policy 15: "Air quality shall be protected and enhanced, consistent with the purposes of the National Scenic Area Act." Includes requirement for states of OR and WA and the Forest Service to "continue to monitor air pollution and visibility levels in the Gorge" and "provide annual reports to the Gorge Commission on progress made regarding implementation of this policy [regional air quality strategy]." | **Air Quality** |