

Vital Signs Indicators Project State of the Gorge 2009



A report on the conditions of scenic, natural,
economic, cultural and recreation resources in the
Columbia River Gorge National Scenic Area



May 2009
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USDA Forest Service Columbia River Gorge NSA

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Columbia River Gorge Commission
& USDA Forest Service - Columbia
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Joanna Grammon



Hood River Waterplay



Joanna Grammon

Foreword

The Columbia River Gorge National Scenic Area Act of 1986 has two purposes. The first mandates protection and enhancement of scenic, cultural, natural and recreation resources. The second requires protection and support of the economy of the gorge by encouraging growth in existing urban areas and by allowing future economic development in a manner that is consistent with protection and enhancement of resources.

The Columbia Gorge National Scenic Area is renowned for its spectacular beauty. Scenic resources span a diverse array of landscapes including dense forests, rolling farmlands and semi-arid grasslands. Cultural resources, including prehistoric sites and historic structures are epitomized by the famous Indian petroglyph “She Who Watches,” and trace a human history in the gorge that is over 10,000 years old. Natural resources include diverse landscapes that support habitat for sensitive wildlife and plants; streams; lakes; wetlands and riparian corridors. These resources and more are found in abundance throughout the National Scenic Area (NSA). And then there is recreation . . . The NSA is known worldwide for the variety and quality of its recreational opportunities: windsurfing, hiking, fishing, mountain biking, kayaking and kiteboarding. And, with all of this - it’s also a place where thousands of people make their homes, work and play.

The National Scenic Area Act designated special protection for 292,500 acres on both sides of the Columbia River from the outskirts of Portland-Vancouver in the west to the semi-arid regions of Wasco County and Klickitat County in the east. The NSA is categorized into three areas: Special Management Areas, General Management Areas and Urban Areas.

Special Management Areas (SMA), which generally contain the most sensitive resources, total 114,600 acres. Much, but not all, of the SMA are national forests managed by the Forest Service. General Management Areas (GMA), with 149,400 acres, include a mixture of land uses such as farming, forest practices and cattle grazing. Development on state and private lands within the GMA and SMA are administered by gorge counties and the Columbia River Gorge Commission. Exempt from Scenic Area regulations are 13 Urban Areas in the gorge: Cascade Locks, Hood River, Mosier and The Dalles in Oregon; and North Bonneville, Stevenson, Carson, Home Valley, White Salmon, Bingen, Lyle, Dallesport and Wishram in Washington.

The Vital Signs Indicators Project is the Columbia River Gorge Commission’s highest priority. To fulfill our responsibilities under the Scenic Area Act, the Commission and our partner agencies must be able to understand and track changes to the condition of gorge resources. The complexities of our region and the inter-relatedness of seemingly distinct issues make this task challenging, but no less necessary.

The Vital Signs Indicators Project has multiple goals:

1. Develop a set of high level measures to assess the conditions of gorge resources
2. Inform future plan review sessions, and guide adaptive management
3. Build new and strengthen existing relationships with our partner agencies and gorge communities
4. Share information through community presentations and a dedicated website

This report contains the high level measures of gorge health identified in the first goal listed above and what we know about them using the most current available information. The measurements were developed through a transparent public process with the help of two chartered teams (a technical advisory team as well as a community advisory team composed of experts, residents and other stakeholders in the gorge), involvement by our partner agencies and with independent oversight from the Institute of Natural Resources. Additionally, the Commission’s Assessment Committee provided guidance throughout the process. The information included in this report relies heavily on work done by our partner agencies, Forest Service and Commission staff. It serves as the starting point for future reporting to track changes in condition over time, enabling more informed and proactive management decisions.

A letter from the chair

The Columbia River Gorge has a rich and storied history – historic home of native people; exploration pathway for European settlement; salmon lifeline; agricultural gem; scenic wonderland; hydroelectric power provider; and, most recently, recreational mecca. Without doubt, the gorge is one of the special places on earth.

In 1986, Congress recognized that the gorge needed protection if it was to remain special, enacting the Columbia River Gorge National Scenic Area Act. This law created an expectation that the scenic, natural, cultural and recreational qualities of the gorge would be protected and enhanced while allowing economic development to occur in ways that did not denigrate its special qualities. The Columbia River Gorge Commission was created to carry out this mission.

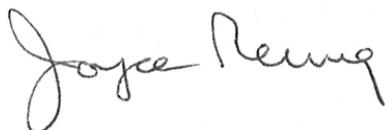
The release of *Vital Signs Indicators Project – State of the Gorge 2009* marks the beginning of a new era for the Gorge Commission. For the first time in its history, the Commission will have information that assesses and tracks the overall health of the gorge over the long term. The report provides us with a set of facts about key issues in the gorge. For the first time, we know how much visible development is increasing, the degree to which environmental degradation is occurring in recreation areas, and the status of at-risk plants in the gorge.

The release of this first report is just the beginning of our journey toward understanding the issues affecting the long term health of the gorge. We need to continue to evaluate this new information to address scenic, natural, economic, cultural and recreation issues or concerns in a timely manner. We also need to develop indicators for the remaining topics that are not included in this first report. Finally, the Commission will need to decide whether or not to set goals or identify potential thresholds for the Vital Signs once we have a better understanding of current conditions.

The creation of the Vital Signs provides the Commission with the opportunity to better understand the effectiveness of its efforts to protect and enhance gorge resources. Along with the Vital Signs, the Commission is developing a set of agency performance measures that will allow us to judge our performance in carrying out the strategies that have been put in place. Together, this information will be used to inform the next update of the National Scenic Area Management Plan.

I want to thank all the individuals who devoted their valuable time and energy to this effort. In my 22 years on the Commission, I have never seen a more inclusive and transparent process than the development of this report. This Vital Signs Indicators Project would not have been possible without the collaborative involvement of the Forest Service, the treaty tribes, our stakeholders and partner agencies and the citizens of Oregon and Washington. Assessment Committee Chair Dan Harkenrider, Technical Advisory Team Chair Susan Wolff and Community Advisory Team Chair North Cheatham deserve special recognition for their leadership in this process.

In five years, I expect to be able to look back at the publication of this report as a milestone for the Columbia River Gorge Commission in focusing on the long term health of the gorge and the contributions the organization makes to that health.



Joyce Reinig
Chair, Columbia River Gorge Commission

A letter from the director

What is happening with the SNECRs (scenic, natural, economic, cultural, recreation resources)? Ever since I became the executive director of the Gorge Commission, finding out how the scenic, natural, economic, cultural and recreation resources in the gorge were faring has been my highest priority. The *Vital Signs Indicators Project – State of the Gorge 2009* report provides the Commission with its first set of clues to answer that question.

Despite its slim appearance, *Vital Signs Indicators Project – State of the Gorge 2009* contains a great deal of new information. Of the 24 indicators included in this report, only five had data that was available “off the shelf.” Thirteen required staff to perform extensive analysis on existing information to create useful information, and six others had to be developed from scratch. With few exceptions, data is simply not collected that is specific to the National Scenic Area.

No doubt this report will raise more questions than it answers. Is, for instance, an eight percent increase in visible development over a 15-year period something to be concerned about? Or is the fact that 20% of recreation sites are considered significantly environmentally degraded an issue? Or what to do about the fact that only three of 14 landscape elements in the gorge are considered to be high functioning?

Challenging, yes, but for the first time commissioners and stakeholders will be discussing a mutually agreed upon set of facts that paint the big picture when deciding a future course of action on a particular issue. As indicators consultant Jeff Tryens likes to say, “This report won’t end the bickering about what’s best for the gorge but, from now on, you can argue about the meaning of facts rather than relying on anecdotes.”

When I decided to throw this party, I wondered whether anyone would come. I am happy to say that the engagement by everyone involved in the development of this report has been extraordinary. The Community Advisory Team had almost as many members at its last meeting that it had at its first. Technical Advisory Team members provided their uncompensated expertise until the job was done. Commission Assessment Committee members provided valuable on-going guidance. And Commission staff performed admirably in the unaccustomed role of data developers. A special thanks goes to lead planner Angie Kenney for her ability to keep everyone on board and on task despite some very challenging conditions. See the acknowledgements page for a complete list of participants.

What next? Successful completion of the Vital Signs Indicators Project remains the Gorge Commission’s highest priority. Trying budgets may slow the process down but this report will most certainly not become one of those reports “gathering dust on a shelf.” The Commission will use the information to better inform itself about key issues that need to be addressed in the next update of the management plan. Adaptive management strategies will be developed to respond to issues flowing from the report. And agency performance measures that were created as part of this process will allow staff resources to be deployed more strategically. In the coming months we will begin developing data for the indicators scheduled for the second phase of the project.

Tracking these indicators over time will provide invaluable information about trends in gorge resource health. The more we and our partners use this data the better it will become. As new information becomes available, it will be posted on the Commission website. I urge every stakeholder and interested citizen to dig into this information, including all the linked back-up material, to raise questions, post theories and make suggestions for improving how the Commission goes about its business.



Jill Arens,
Executive Director, Columbia River Gorge Commission

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Executive Summary

This report is designed to provide readers with a succinct overview of what is known about the current conditions of scenic, natural, economic, cultural and recreation resources (SNECRs) in the Columbia River Gorge National Scenic Area. With a continued effort in collecting this data, the information contained in this report will serve as a point from which to track change in conditions over time. A team of experts, citizens and stakeholders volunteered their time to help craft 51 measures that they believe can tell the story of how the gorge is faring over time. These measures are known as the Vital Signs Indicators.

Engaging in a process known as civic science, groups of technical experts and gorge citizens spent six months working together to hone a set of measures that was both technically sound and meaningful to the public. The typical “scientists propose/citizens oppose” scenario was replaced by experts and citizens working together from the beginning to identify what mattered. While interactions between the Technical Advisory Team (TAT) and the Community Advisory Team (CAT) were sometimes quite lively, the final set of indicators was enthusiastically adopted by both groups.

State of the Gorge 2009 presents data on 23 of the highest priority Vital Sign Indicators. At least a few indicators are included for each of the five SNECRs. Much of the information is brand new; either because this is the first time the data has been gathered (like number of buildings seen from selected public vantage points) or because existing data was reinterpreted to focus on the National Scenic Area, like per capita income. Some of the measures, as noted, are proxies for the original TAT/CAT measures. This is because the specific data needed to answer the original measure simply was not available. The proxy measures provide an overview of the most relevant information that is currently available while staff works toward developing new data to answer the original measure or refining the measures to provide us with better information.

What story do the measures tell? Since the indicators were chosen, at least partially, to measure areas of concern, the challenges they identify should come as no surprise in hotly contested areas like environment and scenic quality. What may surprise you is how little is known about very important aspects of gorge health. For instance, no scientific consensus exists regarding air quality trends. No clear methodology is available for gauging the overall condition of gorge cultural resources. Assessments of the condition of at-risk species in the gorge are limited to plants and are spotty at that.

State of the Gorge 2009 is not a “report card” on the health of the gorge. It is simply a report on what is known about key issues related to the long term health of the five gorge resource areas identified in the National Scenic Area Act.

The information for each of the five resource areas tells a somewhat different story.

Scenic Resources – The scenic resource story is about establishing a base for future comparison. This chapter provides new information on three important scenic resource issues: 1) the amount of development that noticeably contrasts with its surrounding landscape; 2) the amount of visual impairment of views caused by vegetation; and 3) the amount of development within landscape types.

Natural – The natural story is that most of the indicators show the resource functioning at varying levels of capability. The natural resources section provides information on five issues: terrestrial habitat quality, aquatic habitat quality, surface water quality, air quality and the condition of at-risk plant species in the gorge. This information is derived from existing sources. All of the natural indicators incorporate some standard relating to good quality (e.g. habitat types that are “properly functioning”). For all of the indicators, except air, the data shows that the current situation is less than good in the majority of cases.

Economic – In the economy arena, the gorge story is similar to that of its host states. This area has the most indicators in this report, six, and the most indicators with data available over multiple years. Issues covered include income, building activity, agricultural use of land and housing affordability. Much of the information is reported for the first time at the NSA level. Generally, the economic well being of NSA residents and the economies of the four rural gorge counties mirror state trends but the data show significant variation among counties.

Cultural – Because of the vast cultural significance of the gorge we continue to learn more about its past every day. Assessing the condition of archaeological resources that have been here for millennia and historic resources that vary greatly in type is a complex task. We learned there is no consensus among experts on a straightforward methodology for consistently gauging the condition of cultural resources. Two salient facts are known: the number of significant resources identified and the number of known resources damaged by development. The data shows that an average of five new archaeological and three new historic resources are identified each year. Also no significant sites were damaged due to development in the past two years.

Recreation – The story in recreation is the need for an understanding of what “good” is. The section covers four recreation related issues: overcrowding, environmental degradation, disability access and visitor experience. Data for the first three topics are derived from a new survey completed by the Commission in 2008. The visitor experience indicator is drawn from five surveys conducted by the Forest Service and the two US Army Corps of Engineers dams in the gorge. The Commission survey of all gorge recreation providers, another first of its kind, showed that about 1/5 of all sites are overcrowded more than 30% of the time in high season. Twenty percent of sites were deemed to have significant human-caused environmental damage. Also, about 50 percent of all sites meet at least one Americans with Disability Act requirement.

The development of this information is an important first step but it’s just the beginning. Understanding what the information is saying about the condition of gorge resources is the next task. Is a half percent per year increase in noticeably contrasting visible development in rural areas of the gorge tolerable? How serious are the problems with watersheds that are deemed impaired? What’s the Commission’s role in addressing problems raised by the report?

Over the next several years, the Commission will work with stakeholder groups, agency partners, tribal nations, experts and interested citizens to answer these and the many other questions raised by this important report.

Comprehensive list of all 51 Vital Signs Indicators

Goal	Indicator	Status
Scenic: Protect and enhance scenic resources		
	1.1.a: Overall Scenic Quality: Percent of public who perceive scenic resources to be in good condition or better according to both: a) residents and b) visitors.	2011
	1.1.b: Development Impacts: Percent of seen area, as viewed from public vantage points, containing development that highly contrasts with its surrounding landscape: a) within 1/4 mile; b) between 1/4 mile and 3 miles; and c) beyond 3 miles.	2011
	1.1.c: Development Impacts: Number of developed areas, as seen from public vantage points, that highly contrast with their surrounding landscape: a) within 1/4 mile; b) between 1/4 mile and 3 miles; and c) beyond 3 miles.	2009
	1.1.d: Vantage Point Quality: Number of scenic observation points with significantly impaired panoramic views due to vegetation.	2009
	1.1.e: Litter and Graffiti Impacts: Percent of highway miles with significant graffiti or litter.	2011
	1.1.f: Night Light: The effect of ambient light on the night sky.	2011
	1.1.g: Visibility: Placeholder for visibility indicator.	Summary in 2009
	1.2.a: Overall Landscape Quality: Percent of each landscape type that is in good condition.	2011
	1.2.b: Development Impacts: Percent of land area with development for each landscape type.	2009
Natural: Protect and enhance natural resources		
	2.1.a: Habitat Quality: Percent of priority habitat types rated as properly functioning.	2009
	2.1.b: Habitat Fragmentation: Percent of priority habitat types that are lost or fragmented by human activity.	2011
	2.1.c: Species Health: Percent of at-risk species whose populations in the gorge are healthy.	2009
	2.1.d: Species Range: Percent of native species (wildlife, plants, invertebrates) with ranges that are declining.	2011
	2.2.a: Surface Water Quality: Percent of streams, including the Columbia River, whose water quality is a) poor, b) fair, c) good, and d) excellent.	2009
	2.2.b: Habitat Quality: Percent of native fish habitat that is properly functioning.	2009
	2.2.c: Surface Water Quantity: Percent of streams with satisfactory in-stream flows.	2011
	2.2.d: Groundwater Quantity: Square miles of groundwater restricted areas.	2011
	2.2.e: Groundwater Quality: To be developed.	2011
	2.3.a: Air Quality: To be developed.	Summary in 2009
Economic: Protect and support the economy		
	3.1.a: Income: Per capita income of NSA urban area residents as a percent of state and non-metro per capita income: a) Oregon side and b) Washington side.	2009
	3.1.b: Job Growth: Net job growth: a) Oregon side and b) Washington side.	2009
	3.1.c: Construction: Building permits issued by urban area: a) housing, b) commercial, and c) industrial.	2009
	3.1.d: Vacancy Rate: Commercial vacancy rate by urban area.	2011
	3.1.e: Housing Affordability : Percent of households that can afford the median priced house.	2009
	3.2.a: Activity: Total number of a) agriculture and b) forestry enterprises.	2011
	3.2.b: Revenue: Total revenue of a) agriculture and b) forestry enterprises.	2011
	3.2.c: Payroll: Total payroll of a) agriculture and b) forestry enterprises.	2011
	3.2.d: Land Base: Total acreage in a) agriculture uses and b) forest uses.	2009

	3.3.a: Income: Per capita income of NSA non-urban area residents as a percent of state and non-metro per capita income: a) Oregon side and b) Washington side.	2009
	3.3.b: Job Growth: Net job growth in rural areas: a) total; b) Oregon side; c) Washington side.	2011
	3.3.c: Construction: Building permits issued in rural centers and non-urban areas: a) housing, b) commercial, and c) agricultural.	2009
	3.3.d: Activity: Number of rural and rural center enterprises: a) total; b) Oregon side; c) Washington side.	2011
Cultural: Protect and enhance cultural resources		
	4.1.a: Condition: Percent of all monitored archaeological sites in good condition.	2009
	4.1.b: Awareness: Percent of stakeholders understanding the archaeological resource protection process.	2011
	4.1.c: Awareness: Percent of residents of and visitors to the gorge understanding the importance of archaeological resources.	2011
	4.1.d: Inventory: Number of new significant archaeological resources identified each year.	2009
	4.2.a: Condition: Percent of all monitored historic resources in good condition.	2009
	4.2.b: Awareness: Percent of stakeholders with understanding of historic resource protection process.	2011
	4.2.c: Awareness: Percent of residents of and visitors to the gorge understanding the importance of historic resources.	2011
	4.2.d: Inventory: Number of new significant historic resources identified each year.	2009
	4.3.a: Condition: Percent of all monitored traditional cultural properties in good condition.	2011
	4.3.b: Awareness: Percent of stakeholders understanding the traditional cultural properties protection process.	2011
	4.3.c: Awareness: Percent of residents of and visitors to the gorge understanding the importance of traditional cultural properties.	2011
	4.3.d: Inventory: Number of new significant traditional cultural properties identified each year.	2011
Recreation: Protect and enhance recreation resources		
	5.1.a: Recreation Demand: Percent of recreation sites at or above capacity more than X percent of the time on high season days - total and by recreation activity type.	2009
	5.1.b: Environmentally Sustainable Recreation: Percent of recreation sites that are environmentally degraded - total and by recreation activity type and specified as improving or not improving.	2009
	5.1.c: Recreation Availability: Percent of visitors and residents rating the access to recreation activities as good or better - total and by recreation activity type.	2011
	5.1.d: ADA Accessibility: Percent of recreation sites that meet ADA standards - total and by recreation activity type.	2009
	5.2.a: Recreation Quality: Percent of visitors and residents rating the overall recreational qualities of the Gorge as good or better.	2011
	5.2.b: Recreation Site Quality: Percent of site users rating their overall experience as good or better - total and by recreation site.	2009
	5.2.c: Recreation-related Conflicts: Number of reported incidents relating to recreational uses by type of incident.	2011

Please note that both of the air quality indicators are discussed in one summary, included in the natural resources chapter. In total, 24 of the 51 Vital Signs Indicators are discussed in this report.



Angie Kenney



Daniel Otake



Columbia River Gorge Commission

Goal 1

Protect and enhance scenic resources

The Columbia River Gorge is renowned for its outstanding scenic beauty. In a stretch of just 85 miles, one can view awe inspiring natural landscapes of forests and dramatic waterfalls, towering cliffs and sweeping grasslands, as well as a more rural landscape consisting of orchards, vineyards and pasture lands. The need to protect the special scenic resources of the gorge for future generations is an integral component of the National Scenic Area Act.

These measures track the visual impacts of development on scenic quality. To evaluate the scenic qualities of the natural and rural landscapes of the National Scenic Area, one needs to look at how the built environment contrasts with the surrounding landscape. Many thousands of gorge citizens live within the boundaries of the Scenic Area and new development does occur. In fact, one of the more complicating factors concerning assessing the health of scenic resources is the fact that the gorge is a working landscape. Much of the privately owned land outside of urban areas continues to be used for agriculture and forest practices. These uses supported by the Act, however, a recent shift from orchards and grazing to vineyards is quickly altering the appearance of the rural landscape. Assessing the impacts of these kinds of changes and whether or not they are negative will surely be a major topic of discussion as we continue to collect this data and use it for future policy decisions.

Objectives:

1.1 PROTECT AND ENHANCE SCENIC QUALITY

Protecting scenic views as seen from selected public vantage points

1.2 PROTECT THE VISUAL CHARACTER OF DIVERSE LANDSCAPES

Protecting the character of diverse landscapes regardless of visibility from public vantage points

Objective: Protect and Enhance Scenic Quality

Vital Sign Number: 1.1.c

Vital Sign Title: Development Impacts

Vital Sign Measure: Number of developed areas, as seen from public vantage points, that highly contrast with their surrounding landscape: a) within 1/4 mile; b) between 1/4 mile and 3 miles; and c) beyond 3 miles.

Proxy Measure: Number of buildings¹, as seen from selected public vantage points², which noticeably contrast with their surrounding landscape.

What We Know:

Using the visual monitoring point photographs taken in 2003, 357 noticeably contrasting buildings exist in the landscape when viewed from the public vantage points listed below:

Vantage Point	1988 Building Count	2003 Building Count	Change
Steigerwald Lake	17	30	13
Crown Point	57	74	17
Cape Horn	29	29	0
Upper Beacon Rock	44	43	-1
Dog Mountain	3	6	3
Mitchell Point	13	14	1
Hood River Jetty	49	43	-6
Straights Point	17	22	5
Memaloose Overlook	40	42	2
Rowena Crest Viewpoint	49	41	-8
Squally Point	11	11	0
Avery Boat Launch	1	2	1
Total	330	357	27

Assessment:

Between 1988 and 2003, 27 additional buildings noticeably contrasted with their surroundings as seen from the 12 representative public vantage points used for this indicator. This eight percent increase over 15 years was not uniformly spread across the gorge from end to end, however. The majority of new noticeably contrasting buildings occurred in the west end near Troutdale, Oregon and Camas, Washington. Because this data relies on human interpretation of imperfect photos, it is estimated that counts could be as much as 10 percent higher or lower than the reported figure.

¹ Buildings include clusters of pixels or visible developments that appeared to be buildings in the photographs.

² Twelve public vantage points were selected for long term monitoring based on: a) diversity of views – ranging in levels of development, b) equal representation of all six Gorge counties – providing a cross section of the eastern and western and northern and southern Gorge views, and c) their ability to encompass large panoramic views.

Objective: Protect and Enhance Scenic Quality

Vital Sign Number: 1.1.d

Vital Sign Title: Vantage Point Quality

Vital Sign Measure: Number of scenic observation points with significantly impaired³ panoramic views due to vegetation.

What We Know:

Fourteen of the 40 monitored scenic observation points are significantly impaired by vegetation.

Scenic Travel Corridor	Number of Sites Monitored	Impairment Greater than 50%	%
SR 14 - West	9	3	33%
SR 14 - East	7	0	0%
SR 14 Total	16	3	19%
HCRH - West	11	8	73%
HCRH - East	4	0	0%
HCRH - Total	15	8	53%
I-84 - West	7	3	43%
I-84 - East	2	0	0%
I-84 Total	9	3	33%
Gorge- West	27	14	52%
Gorge - East	13	0	0%
Gorge - WA	16	3	19%
Gorge - OR	24	11	46%
Total	40	14	35%

Assessment:

Of the 40 sites chosen for this assessment, 35% were found to be significantly impaired due to vegetation. All impaired sites were found in the western half of the gorge. However, impairment varies significantly among the three scenic travel corridors assessed – Washington State Route 14, Historic Columbia River Highway and Interstate 84. About three-quarters of the western portions of the Historic Highway sites are significantly impaired. Nearly half of the western I-84 sites and one-third of the western SR-14 sites are significantly impaired. Of the 13 eastern gorge sites assessed, only the Historic Highway Memaloose Overlook is even somewhat impaired (15%). While nearly half (46%) of all Oregon sites are significantly impaired, less than one in five (19%) are impaired in Washington. This is partially due to the high degree of impairment found on the historic highway (53% overall) which is exclusively in Oregon. See the Scenic Chapter Endnotes for more information.

It should be noted that the western half of the gorge contains far more forested areas than that of the east, and that in some cases, SR-14 travels closer to the railroad and the Columbia River on the Washington side (preventing some opportunities for new vegetation) than I-84 and the Historic Highway on the Oregon side.

³ For this indicator, significantly impaired means that the view was more than 50% impaired by vegetation.

Objective: Protect the Visual Character of Diverse Landscapes

Vital Sign Number: 1.2.b

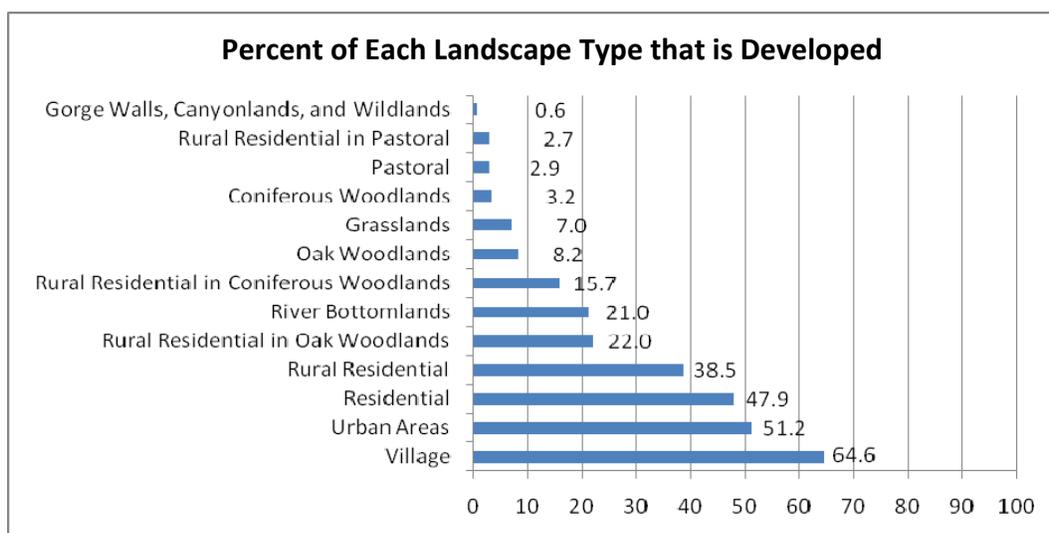
Vital Sign Title: Development Impacts

Vital Sign Measure: Percent of each landscape type that is in good condition.

Proxy Measure: Percent of land area with development⁴ for each landscape type.

What We Know:

Using existing landscape settings, the gorge was divided into 13 landscape types ranging from “Gorge Walls, Canyonlands and Wildlands” to “Urban Areas⁵”. The total area of each landscape type was then assessed for how much developed land cover it contained based on 2004 satellite imagery classification ranging from less than 1% area developed in Gorge Walls, Canyonlands and Wildlands to almost 65% area developed in the Village landscape type.



Assessment:

The amount of development in a landscape setting ranges from less than 1% to over 60%. As expected, the most settled areas - Urban Areas, Village, and two types of residential settings - are more developed than others. Village has a higher percentage of developed area than Urban Areas because Urban Areas were delineated with potential city expansion in mind while villages were delineated based on existing high density areas of commercial, residential and public facility type mixed uses. Other Residential zoning development levels vary from 2.7 % for Rural Residential in Pastoral to 22% in Rural Residential in Oak Woodlands. Larger lot sizes and tree cover obscuring structures may impact these values. Gorge Walls, Canyonlands, and Wildlands and Coniferous Woodlands have low percentages of developed land cover (0.6% and 3.2% respectively). The primary owner of these lands is the federal government so these low values are not unexpected.

These data establish an estimate for developed area by landscape type in the year 2004. However, future analysis will incorporate historic and current imagery as well as classification methods designed specifically to detect development to create a more accurate picture of development over time.

⁴ Development (for this indicator only): Roads, buildings and other structures that are detected using satellite imagery.

⁵ Urban Areas are not among the landscape settings described in the Management Plan for the Columbia River Gorge National Scenic Area but are included in this analysis as a landscape type for comparative purposes.

Scenic Chapter Endnotes:

1.1.c Development Impacts

Source: Staff analysis of USFS photos taken in 1988 and 2003.

For this indicator only buildings (including building-shaped objects) were counted. Each landscape photo was divided into approximately 1/2 inch squares. The count was done by adding up the number of buildings or building-shaped objects that could be seen at first glance of an individual cell. Before being counted, identified objects were carefully examined to determine if they were buildings or natural features. Objects that appear in cells of distant areas of a photo often required the viewer to make a judgment as to whether or not it appeared to be a building. Because the difference between highly contrasting and noticeably contrasting was impossible to discern for individual structures, noticeably contracting replaced highly contrasting as the standard. Differing quality of the two sets of photos meant that small adjustments had to be made to assure that an image that obscured a building due to its darkness in 1988 was treated the same as the lighter image of 2003 that clearly showed the same building.

1.1.d Vantage Point Quality

Sources: A new inventory was created for this indicator using 2009 photographs taken in the field and Google Earth Street View images (that use photographs taken in 2006). Portions of the 1990 *Corridor Visual Inventory* and the 1988 *Fixed Point Photography Narrative* were used to help identify appropriate sites. The most nominated sites from a recent citizen survey were also included in the inventory.

To monitor the vegetation impairment of viewpoints along the three scenic travel corridors of the gorge, forty sites were selected for long term monitoring. The sites were selected as representative views, evenly distributed throughout the Washington and Oregon sides and east and west halves of the gorge. The selected views intend to encompass most of the iconic views of the National Scenic Area.

Observation points consist of pull-outs along the road and individual segments that contain iconic views but do not have a pull-out from which to view them. It should also be noted that some iconic waterfall views chosen along the Historic Highway would not be considered panoramic as specified by the indicator.

The term “significantly impaired” has been defined for this indicator to mean greater than 50%. If an observation point was more than 50% impaired by vegetation, then it was rated as “significantly impaired.” Conversely, if the point was impaired 50% or less by vegetation, it was rated as “not significantly impaired.” A complete inventory of the monitored sites, including locations, photographs and analysis of impairment, is available on our website at www.gorgevitalsigns.org.

1.2.b Development Impacts

Sources: Land cover classification based on 2004 satellite imagery, USFS, CRGC. Landscape Setting designations, 1992, CRGC.

The percent of land area that is developed for each landscape type, as described by the Forest Service data, was determined by combining the satellite imagery data with the landscape setting designations. Because the original analysis was done for a different purpose, the accuracy of the findings for this indicator is limited.

Future analysis will consist of classification of historic, current and future Landsat ETM+ imagery with methods designed to specifically extract the land cover classes of interest. (The Landsat Program is a series of Earth-observing satellite missions jointly managed by NASA and the U.S. Geological Survey. The Landsat Enhanced Thematic Mapper Plus (ETM+) is a sensor carried onboard the Landsat 7 satellite.)



John McSherry



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Goal 2

Protect and enhance natural resources

Climate, geology, soils, plants, wildlife and other habitat elements combine to make the gorge rich in natural resources. Many significant natural areas occur in the gorge, ranging from old growth forests in the Multnomah Basin to bunchgrass prairies in the Columbia hills. The diverse climate fosters nearly 1,000 species of wildflowers, many of which are endemic to the Gorge region. The wildlife traveling in and out of the gorge, the long rivers originating many miles away with short scenic area reaches, the quality of air passing through our region – all these are resources to be protected in the scenic area. Yet the condition of all these things depends on many factors beyond our boundaries or control. For this reason, development of indicators gauging the condition of gorge natural resources is uniquely challenging and more difficult than most other topics. Indicators were created to measure the health of native plants and animals and their habitat, surface and ground water quality, and air quality.

Objectives:

2.1 PROTECT AND ENHANCE THE NATIVE PLANTS AND ANIMALS AND THE HABITATS WHICH SUPPORT THEM

Tracking the health of gorge species and habitat function over time

2.2 PROTECT AND ENHANCE QUALITY OF THE WATER AND AQUATIC HABITATS

Measuring key characteristics of water that indicate water quality and habitat quality

2.3 PROTECT AND ENHANCE QUALITY OF THE AIR

Summarizing what's known about the air quality of the gorge

Objective: Protect and Enhance the Native Plants and Animals and the Habitats which Support Them

Vital Sign Number: 2.1.a

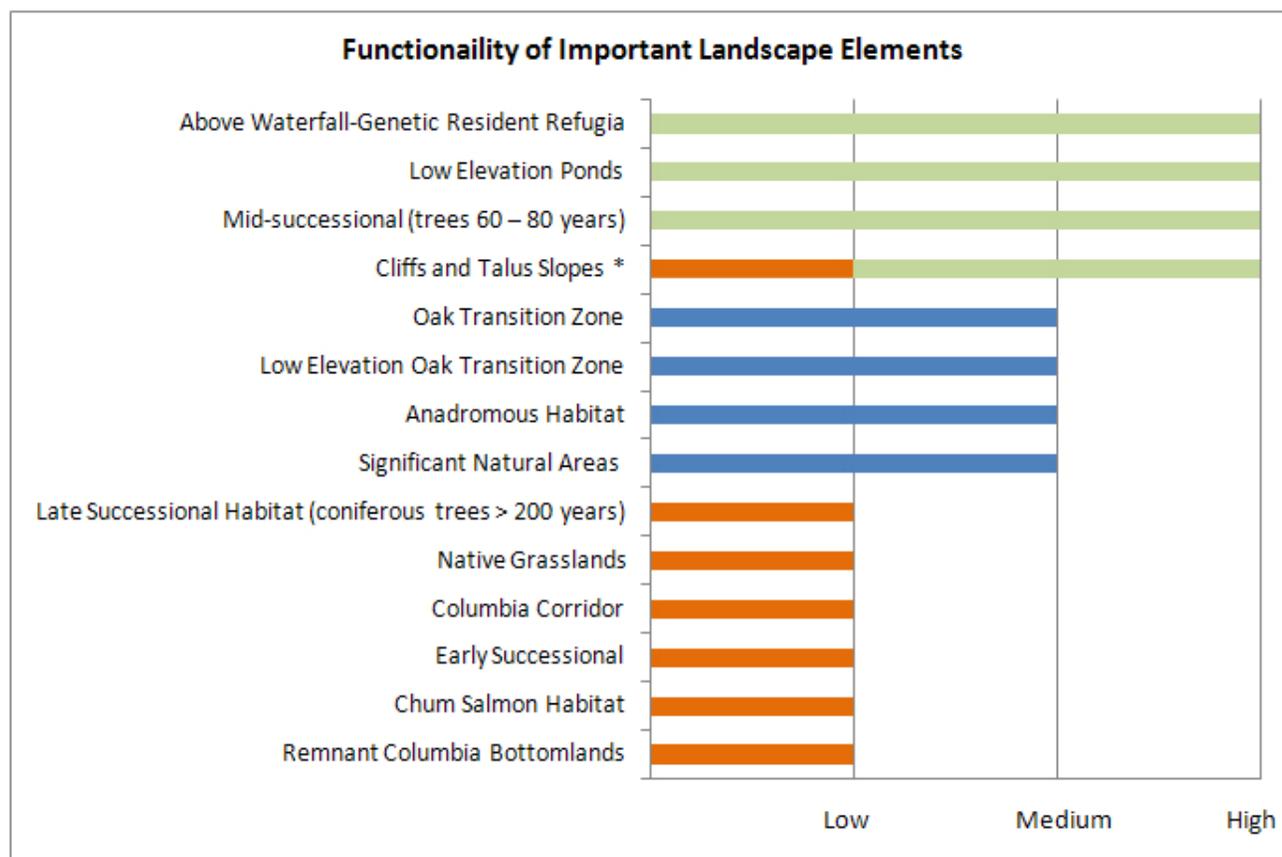
Vital Sign Title: Habitat Quality

Vital Sign Measure: Percent of priority habitat types rated as properly functioning.

Proxy Measure: Number of important landscape elements⁶ in the Scenic Area that are functioning at high levels.

What We Know:

Three of fourteen landscape elements in the gorge are considered high-functioning: Above Waterfall-Genetic Resident Refugia (i.e. areas supporting isolated populations of genetically pure fish species); Low Elevation Ponds; and Mid-successional Forests. A fourth landscape element – Cliffs and Talus Slopes – is partially high-functioning. Additionally, four elements are medium-functioning, and six are low-functioning with Cliffs and Talus Slopes rated as partially low-functioning depending upon location.



(* Cliffs and talus slopes are both high and low-functioning depending on location.)

⁶ Landscape elements are components of the priority habitats based on the unique species they support and their rarity. (They are not the same as the landscape types discussed in indicator 1.2.b)

Assessment:

Though a majority of landscape elements in the Scenic Area are functioning at a medium or high-level, many of these elements are considered marginal and fragile. However, both Anadromous Habitat and Above Waterfall Resident-Genetic Refugia are demonstrating an improving trend. This is perhaps a reflection of a regional emphasis on salmon habitat conservation and restoration and the focus of state and federal agencies and tribal nations.

Many of the low-functioning habitats reached that status due to the conversion of land to agriculture, timber harvests and the disturbance of the natural fire cycles. Other human activities such as roads, railroads, water diversions and settlements have also contributed to reduced function.

This information is based on a largely qualitative assessment by Forest Service scientists. Future analysis will focus on spatially identifying these landscape elements and when possible monitoring specific components that affect their function. The expert opinions of the Forest Service biologists and hydrologists will continue to be an important aspect of this assessment.



Washington State Tourism

Objective: Protect and Enhance the Native Plants and Animals and the Habitats which Support Them

Vital Sign Number: 2.1.c

Vital Sign Title: Species Health

Vital Sign Measure: Percent of at-risk species⁷ whose populations in the gorge are healthy⁸.

What We Know:

Rankings exist only for plants at this time. Twenty-nine percent (8 of 28) of the at-risk plant species, either currently existing or known to be present in the past, are known to be healthy. Eleven of the 28 at-risk plant species (39%) known to currently exist in the gorge have been observed but lack a health assessment. Twenty-five percent of the observed at-risk species in the gorge are considered less than healthy. No assessments of animal species are available.

Status of At-Risk Plant Species in the Gorge		
Species	Number	Percent
Observed – Healthy	8	29
Observed – Less than healthy	7	25
Observed – No ranking	11	39
Known to exist historically but not observed	2	7
Total At-Risk Plant Species	28	100

Assessment:

Findings are based on observations of 172 populations of at-risk species found in the gorge. The number of observations per species varies from just one for a few species to over 25 for others. Because observations of species used in the ranking can be quite old (45 population health rankings are over 20 years old) and because many observations lack a health ranking, these numbers should be considered rough estimates. Also, eleven of the species known to exist in the gorge have not been ranked for health status. If all of those observed but not ranked species were healthy, the overall ranking could be as high as 60%.

The data used in this proxy measure is the most relevant available information provided by the Oregon Natural Heritage Program (ONHP). The inventory itself is still a draft but contains very useful information for plants. For future reporting, Commission and Forest Service staffs will be working together with partner agencies to either refine this measure so that it is more easily answered with currently available data or develop new data to better answer the existing measure.

⁷ At-risk species are those species either listed under the federal or state Endangered Species Act or whose conservation status is ranked as endangered, threatened, imperiled, or vulnerable to extinction.

⁸ A species population (occurrence) is one with a viability ranking of good or excellent as compiled by the ONHP.

Objective 2.2: Protect and Enhance the Quality of Water and Aquatic Habitats

Vital Sign Number: 2.2.a

Vital Sign Title: Surface Water Quality

Vital Sign Measure: Percent of streams, including the Columbia River, whose water quality is a) poor, b) fair, c) good, and d) excellent.

Proxy Measure: Number of watersheds, including the Columbia River, where water quality is a) impaired, and b) good.

What We Know:

Of the 13 watersheds in the National Scenic Area, eight have impaired water quality and five have good water quality. They break down as follows:

Western Gorge

- | | |
|-------------------------------|------|
| 1. Lower Sandy River | Good |
| 2. Western Gorge – Oregon | Good |
| 3. Western Gorge – Washington | Good |

Central Gorge

- | | |
|------------------------------|----------|
| 4. Hood River | Impaired |
| 5. Mosier Creek | Impaired |
| 6. Wind River | Impaired |
| 7. Little White Salmon River | Impaired |
| 8. White Salmon River | Good |
| 9. Catherine & Major Creeks | Impaired |

Eastern Gorge

- | | |
|---------------------------|----------|
| 10. Klickitat River | Good |
| 11. Fifteen-mile Creek | Impaired |
| 12. Lower Deschutes River | Impaired |

Entire National Scenic Area

- | | |
|--------------------|----------|
| 13. Columbia River | Impaired |
|--------------------|----------|

Assessment:

With eight of the 13 watersheds in the gorge rated as impaired, poor water quality is a serious issue for the gorge. Because many of the rivers in these rated watersheds begin their journeys to the sea far outside the NSA boundaries, these ratings really reflect on the Northwest as a whole, not just the gorge. The types of issues are far-ranging, from harmful chemicals in the Columbia to higher than normal stream temperatures in many watersheds. Fortunately, three of the major rivers in the gorge – the White Salmon, the Lower Sandy and the Klickitat – still retain high water quality.

Objective 2.2: Protect and Enhance the Quality of Water and Aquatic Habitats

Vital Sign Number: 2.2.b

Vital Sign Title: Habitat Quality

Vital Sign Measure: Percent of native fish habitat that is properly functioning.

Proxy Measure: Number of watersheds, including the Columbia River, where stream habitat quality is good.

What We Know:

Of the 13 watersheds in the National Scenic Area, none had an overall rating of good for stream habitat quality. They breakdown as follows:

Western Gorge

- | | |
|-------------------------------|---|
| 1. Lower Sandy River | Impaired |
| 2. Western Gorge – Oregon | Mostly good - upper reaches; impaired - lower reaches |
| 3. Western Gorge – Washington | Mostly moderate - upper reaches; impaired - lower reaches |

Central Gorge

- | | |
|------------------------------|--|
| 4. Hood River | Impaired |
| 5. Mosier Creek | Impaired |
| 6. Wind River | Good - upper reaches; moderate - lower reaches |
| 7. Little White Salmon River | Moderate |
| 8. White Salmon River | Moderate |
| 9. Catherine & Major Creeks | Good - upper reaches; impaired - lower reaches |

Eastern Gorge

- | | |
|---------------------------|----------|
| 10. Klickitat River | Moderate |
| 11. Fifteen-mile Creek | Impaired |
| 12. Lower Deschutes River | Moderate |

Entire Gorge

- | | |
|--------------------|----------|
| 13. Columbia River | Impaired |
|--------------------|----------|

Assessment:

Despite the substantial resources that have been invested in habitat enhancement and restoration, gorge watersheds still fall far short of providing good quality habitat for fish. Problems in the watersheds causing impairments are wide ranging. Common impairments are a lack of large wood either in-stream or in riparian areas, high sediment loads, and high in-stream temperatures. Many streams are also impacted in their lower reaches where highways, railroads, and hydroelectric dams significantly alter the natural flow of materials and fish. While no watershed receives a clean bill of health for habitat quality, three are considered partially good and six are rated as moderate.

Objective 1.1: Protect and enhance scenic quality
Vital Sign Number: 1.1.g
Vital Sign Title: Visibility
Vital Sign Measure: To be developed

Objective 2.3: Protect and enhance quality of the air
Vital Sign Number: 2.3.a
Vital Sign Title: Air Quality
Vital Sign Measure: To be developed

Air Quality Summary:

This summary addresses the two air quality indicators - listed under the scenic and natural goals. Because the specific language for either measure has not yet been finalized, the available information for air quality has been summarized for this report.

What We Know:

Over the last decade a great deal has been learned about air quality in the gorge. Air quality monitoring started in the 1990s with two sites operated by the U.S. Forest Service at the east end near Wishram, WA and at the west end on Mt. Zion in eastern Clark County. In 2000 the Gorge Commission adopted an amendment to the Management Plan that called for the protection and enhancement of gorge air quality through the development and implementation of a regional air quality strategy. Since then there has been an increased level of monitoring and directed study by state agencies and the tribes under the leadership of the Yakama Nation. This monitoring has increased understanding of the causes of haze and characteristics of air quality throughout the National Scenic Area. These studies are the building blocks for an overall strategy being developed addressing gorge air quality. Below is a list of these studies and reports and a summary of their purpose:

- Columbia River Gorge Haze Gradient Study (2006): This report was produced for Southwest Clean Air Agency (SWCAA) by the Desert Research Institute. The objectives of the study were to characterize horizontal, vertical and temporal patterns in haze and to gain insight into possible source regions contributing to haze in the gorge.
- Causes of Haze in the Gorge (CoHaGo) Report (2006): This report, also produced for SWCAA by the Desert Research Institute followed the Haze Gradient Study. It was “intended to add to the understanding of the source areas and source types contributing significantly to haze in the Columbia River Gorge in the States of Washington and Oregon.”
- Gorge Emission Inventory Report (2008): The Oregon Department of Environmental Quality (ODEQ) created this list of emission estimates for sources of air pollution that may impact the Scenic Area.
- Gorge CAMx Modeling Report (2007): This report was prepared for SWCAA by ENVIRON International and describes meteorological, emissions and air quality modeling that are used to “assess projected trends in future visibility impairment, to provide a simulation assessment of source apportionment by type and region, and to test several “what-if” scenarios for future year conditions.”
- Gorge Science Summary Report (2008): SWCAA and ODEQ used the above four studies to prepare this report in 2008 summarizing “the results of six years of planning, ambient monitoring and visibility assessment activities to understand and characterize visibility conditions and the causes of visibility impairment in the Columbia River Gorge National Scenic Area.”
- Updated Air Quality Trends for the Columbia River Gorge Report (2006): This report was prepared for Klickitat County by Kent Norville of Air Sciences Inc. to review “air quality data from 1989 to 2005 from various monitors located in and around the Columbia River Gorge (CRG) in order to examine trends in air quality.”

- Analysis of 12 Years of IMPROVE Data in the Columbia River Gorge Report (2006): This report was prepared for the Yakama Nation by Dr. Dan Jaffe of the University of Washington and analyzed a 12-year record of IMPROVE aerosol data from the Wishram, Washington site in the Columbia River Gorge.
- Fog Water Deposition in the Columbia River Gorge Report (2007): This U.S. Forest Service (USFS) study sampled fog, bulk precipitation, throughfall, airborne particulates, and lichen distribution and found that the levels and pH of atmospheric deposition “likely threaten gorge ecosystems and cultural resources.”
- Ozone Injury in West Coast Forests Report (2006): This USFS study looked at the impact that ozone has had on west coast forests, and found ozone damage at a forest site in the National Scenic Area.
- Air Pollution and Climate Gradients in Oregon and Washington Indicated by Epiphytic Macrolichens (2005): This USFS study used lichen as an indicator by modeling lichen community gradients in relationship to air quality, climate and other environmental variables. The model was then applied to an entire dataset to assess regional condition and changes in the lichen community condition over time.
- Analysis of Air Quality Data in the Columbia River Gorge During Temporary Shutdowns at the PGE Boardman Plant (2008): This report was prepared for the Yakama Nation by Dr. Dan Jaffe and analyzed months when the PGE Boardman plant was temporarily shut down allowing quantification of the contribution from the Boardman plant to haze in the Columbia River Gorge.

Other currently ongoing studies are also looking at the contribution of agriculture to air quality degradation and the affects of existing air quality levels on prehistoric rock images (May 2009 release, Yakama Nation).

Assessment:

Scientists agree that air quality has been impacted, but have not reached consensus about the trend or the significance of individual sources and their contribution to haze in the gorge. The Gorge Science Summary Report found that visibility impairment in the gorge is typically worse in the winter than it is in the summer, particularly at the eastern end of the National Scenic Area when air stagnation conditions trap and concentrate pollution. Forest Service studies show that gorge haze levels are among the worst for remote area monitoring sites in the Western U.S. Winter haze episodes are dominated by easterly winds with the majority of emissions coming from sources east of the gorge, primarily PGE’s Boardman coal-fired power plant. Winter haze concentrations are most significant at the east end of the gorge, and less significant at the west end of the gorge. Summer haze episodes are dominated by westerly winds with emissions typically coming from the Portland/Vancouver area and other regional sources west of the gorge, or due to wildfires in the region. Summer haze concentrations are most significant at the west end of the gorge, less significant at the east end of the gorge.

The most significant man-made sources contributing to gorge haze were found to include PGE’s Boardman power plant emissions, motor vehicles, non-road emissions (e.g., ships, trains, trucks), agricultural sources of ammonia and woodstoves. Future monitoring work that incorporates the long-term IMPROVE data set with these alternative measurements could benefit the development of indicators of air quality.

Natural Chapter Endnotes:

2.1.a Habitat Quality

Source: EcoVision Report, USFS, 2002.

The US Forest Service 2002 *EcoVision* report describes the functional status of 14 important landscape elements occurring in the Scenic Area. In the context of this report, landscape elements are components of the priority habitats based on the unique species they support and their rarity. Functionality is based on the interruption of landscape flows that can be attributed to disturbance by humans and animals, invasive species encroachment, and the interruption of natural disturbance regimes such as flood, fire, and debris flow.

Landscape elements, physical and biological flows within landscapes, the importance of linkages, the uniqueness of features, and the functional rank of elements were assessed for the report. Forest Service staff relied on their knowledge of the Scenic Area as well as maps depicting landscape features, human development, and the extent of wildlife populations and vegetative cover.

The *EcoVision* Report also contains information on disturbance mechanisms, physical and biological components, and “priority elements” such as threats, ability to influence, uniqueness, ecosystem linkages, and improvement capability for each landscape element. This information was combined with spatial and tabular data and analysis, as well as further consultation with Forest Service scientists to explicitly map landscape elements and function and provide a quantitative assessment of habitat health.

Forty-five significant natural areas were identified using Washington and Oregon Natural Heritage data. Explanation of these determinations is documented in the 1989 report: *Identification of Representative Plant Communities and Botanically Significant Sites in the Columbia River Gorge National Scenic Area*.

2.1.c Species Health

Source: Oregon and Washington Natural Heritage Programs.

<http://www.natureserve.org/explorer/>

Using element occurrence data from the Natural Heritage Programs, species health was determined by averaging the A (assigned a value of 4) through E (assigned a value of 0) rankings made by observers of individual species’ populations. Any species population receiving an average ranking of greater than 2.5 was considered good. It is important to note that element occurrence data is comprised of opportunistic observations. When an observation is reported, it is recorded into the database – with or without an assessment of overall health.

2.2.a Surface Water Quality

Sources:

Sandy River Basin Characterization Report (Sandy River Basin Working Group, 2005)

Sandy River Basin Aquatic Restoration Strategy (Sandy River Working Group, 2007)

Columbia Tributaries West Watershed Analysis (USFS 2001)

Columbia Tributaries East Watershed Analysis (USFS 1998)

Western WA Columbia Tributaries Watershed Analysis (USFS, 2002)

Technical Memorandum No. 7: Water Quality Report: WRIA 27/28 (LCFRB, 2001)

Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan Vol. II, Chapter L (LCFRB, 2004)

Hood River Columbia Tributaries Subbasin Summary 2000 (Northwest Power Planning Council)
Hood River Subbasin Plan, Including Lower Oregon Columbia Gorge Tributaries. (Prepared for Northwest Power and Conservation Planning Council by the Hood River Soil and Water Conservation District, 2004)
Hood River Watershed Action Plan (2008, Hood River Watershed Group)
Mosier Watershed Analysis (Mosier Watershed Council, 2002)
The Dalles Watershed Assessment, (WCSWCD, 2003 included Rowena Creek)
Lower Columbia Salmon Recovery Plan: Wind River (LCFRB, 2004)
WRIA 29 Assesemnt (2005, Skamania County)
Lower Columbia Salmon Recovery Plan: Little White Salmon (LCFRB, 2004)
White Salmon Subbasin Plan (NWPPCC, 2004)
 Washington Department of Ecology draft 303(d) list, 2008
Catherine Major Creek Watershed Open Space Plan (USFW, 2005)
Klickitat Subbasin Plan (NPCC, 2004)
Fifteenmile Watershed Assessment (WCSWCD, 2004)
Fifteenmile Basin Plan (NPCC, 2004)
The Dalles Watershed Assessment, (WCSWCD, 2003)
Deschutes Subbasin Plan, Assessment (DCG, 2004)
Columbia Gorge Mainstem Subbasin Plan 2004 (ODFW for NWPPCC)
Lower Columbia Salmon Recovery & Subbasin Plan (NWPPCC, 2004)
Columbia River Basin: State of the River Report for Toxics (EPA, 2009)

Helpful links to watershed reports:

- EPA Columbia River Basin State of the River Report for Toxics:
<http://yosemite.epa.gov/r10/ECOCOMM.NSF/Columbia/SoRR>
- Washington Department of Ecology Water Quality Assessment and 303(d) Information:
http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html
- Oregon Department of Environmental Quality Water Quality Assessment and 303(d) info:
<http://www.deq.state.or.us/WQ/assessment/assessment.htm>
- Lower Columbia Fish Recovery Board Watershed Management Plans:
<http://www.lcfrb.gen.wa.us/Watershed%20planning%20general/Watershed.htm>
- Northwest Power and Conservation Council Sub-basin Plans:
<http://www.nwcouncil.org/fw/subbasinplanning/Default.htm>
- USGS Oregon Water Science Center: <http://or.water.usgs.gov/>
- Washington Department of Ecology Watershed Resource Inventory Areas:
<http://www.ecy.wa.gov/apps/watersheds/wriapages/index.html>
- Pacific Northwest Aquatic Monitoring Partnership:
<http://www.pnamp.org/web/Content.cfm?SectionID=8>
- Columbia River Inter-Tribal Fish Commission (CRITFC) science page:
<http://www.critfc.org/text/science.html>

- Hood River Watershed Group, Watershed Action Plan and Subbasin Plan www.hoodriverswcd.org
- Klickitat County Watershed Management
<http://www.klickitatcounty.org/NaturalR/default.asp?fD=3>

At this time, no consistent assessment of gorge water quality that addresses the data called for in Indicator 2.2.a exists. The Oregon Department of Environmental Quality has three long term monitoring stations in the NSA (at the mouths of the Sandy, Hood, and Deschutes Rivers) for which it produces a “water quality index” (WQI) measurement that rates water as poor, fair, good or excellent. The Washington Department of Ecology has devised a similar WQI, but none of its monitoring stations are located in the NSA. Subsequently, this report draws on watershed analyses, restoration plans, and other studies and databases addressing water quality in the gorge over the past 15 years. The studies are spotty in coverage, have occurred sporadically and do not use a common language for reporting results.

For this review, a watershed is considered “good” if a) an overall assessment in a reviewed report ranks water quality as generally good or b) the watershed has no listings or issues of concern on the state’s register of impaired water bodies - the 303(d) list. The 303(d) list identifies water bodies with unacceptably high levels of one or more pollutants and/or which do not meet a water quality standard like temperature. The waters of a watershed are considered “impaired” if listed on the state 303(d) list, or a plan for addressing the impairment by setting a Total Maximum Daily Load (TMDL) has been approved by the U.S. Environmental Protection Agency.

2.2.b Habitat Quality

Source: Data derived from multiple reports on watershed quality.

Please see the sources listed under 2.2.a above.

At this time no consistent assessment of stream habitat quality that addresses the data called for in Indicator 2.2.a exists. This report draws on watershed analyses, restoration plans, and other studies and databases addressing habitat quality in the gorge over the past 15 years. Data used to characterize watershed characteristics are drawn from a number of primary sources: U.S. Forest Service, Lower Columbia Fish Recovery Board; the Northwest Power & Conservation Council, the Washington Department of Ecology and the Oregon Department of Environmental Quality. Additionally, stakeholder groups such as the Hood River Watershed Group and the Mosier Watershed Council work with the local soil and water conservation districts to produce assessments and action plans.

For this review, a watershed is considered “good” if conditions that allow for watershed functions to occur are present. This includes characteristics such as an uninterrupted flow of wood, water and/or sediment; a low level of development in the active geomorphic features of the stream system, including the riparian buffer zone; and a highly intact riparian forest with a good wood recruitment potential. Watersheds may be characterized as “moderate” if functions are somewhat impacted due to alterations in the watershed, or “impaired” if functions are significantly impacted.

2.3.a Air Quality

There are a variety of past and on-going studies looking at gorge air quality. Please see:

Oregon DEQ Gorge Air Quality Project Page: <http://www.deq.state.or.us/aq/gorgeair/>

Southwest Clean Air Agency Gorge Reports Page: <http://www.swcleanair.org/gorgereports.html>

USFS Gorge Air Quality Cam Page: <http://www.fsvisimages.com/cori1/cori1.html>



Columbia River Gorge Commission



Joanna Grammon



Columbia River Gorge Commission



Joanna Grammon

Goal 3

Protect and support the economy

Approximately 55,000 people live, work and play in the Columbia River Gorge National Scenic Area. The second purpose of the National Scenic Area Act mandates the Commission to protect and support the economy by encouraging growth to occur in existing urban areas and by allowing new economic development in a manner that is consistent with the protection of the scenic, natural, cultural and recreation resources. Agriculture, forestry and tourism are the chief economic sectors, and are highlighted within the measures contained in this chapter.

Objectives:

3.1 ENHANCE AND SUSTAIN THE ECONOMIC VITALITY OF THE URBAN AREAS

Documenting income, job growth, construction and housing affordability inside the urban areas of the gorge

3.2 PROTECT AND ENHANCE AGRICULTURE AND FORESTRY

Measuring the vibrancy of the agriculture and forestry economies through land use, revenue, payroll and income

3.3 ALLOW ECONOMIC DEVELOPMENT IN RURAL CENTERS AND NON-URBAN AREAS CONSISTENT WITH THE PROTECTION AND ENHANCEMENT OF THE SNCR RESOURCES

Documenting income, job growth, construction and housing affordability outside of the urban areas

Objective: Enhance and Sustain the Economic Vitality of the Urban Areas

Vital Sign Number: 3.1.a

Vital Sign Title: Income

Vital Sign Measure: Per capita income of National Scenic Area urban area⁹ residents as a percent of state non-metro¹⁰ per capita income: a) Oregon side; b) Washington side.

What We Know:

We can estimate National Scenic Area (NSA) urban area per capita income by summarizing U.S. Census data to the blocks groups¹¹ that contain significant portions of those urban areas. The table below shows the urban area income and statewide non-metro income for 1989 and 1999.

Per Capita Income of NSA Urban Area Residents as Percent of State Non-Metro						
	1989		%	1999		%
State	NSA Urban Area	Statewide Non-Metro		NSA Urban Area	Statewide Non-Metro	
Oregon	12,576	11,918	105.5%	17,794	18,057	98.5%
Washington	10,731	12,459	86.1%	17,047	18,280	93.3%

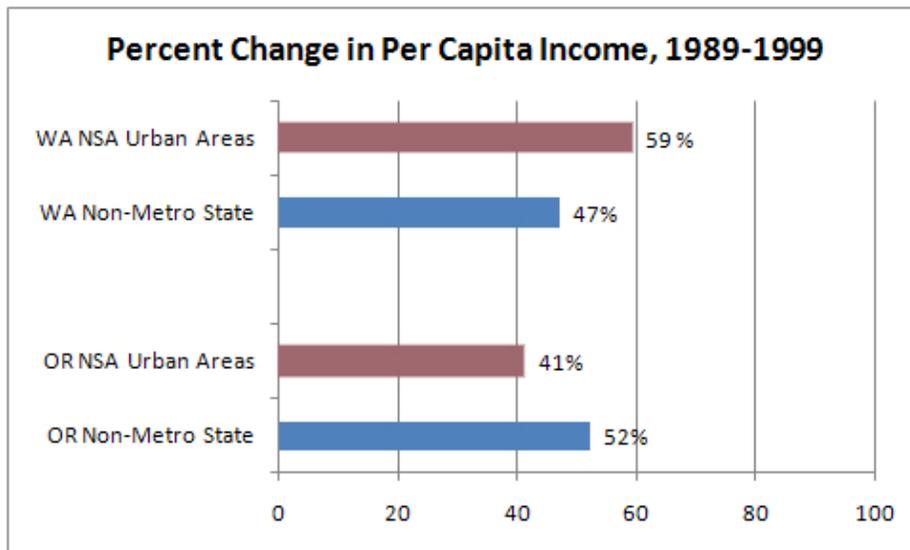
Assessment:

Relative to state-wide non-metro averages, per capita income in the NSA urban areas of Oregon has grown at a slower rate while income in the NSA urban areas of Washington has grown at a faster rate. In 1989, Oregon urban area incomes were approximately 106% of statewide non-metro incomes. However, by 1999, that number dropped to 99%. Conversely, in Washington, urban area incomes grew from 86% of the statewide non-metro average to 93% of that average.

⁹ NSA Urban Area: Census block groups that significantly intersect the 13 National Scenic Area urban areas as defined by Congress and amended by the Gorge Commission.

¹⁰ State non-metro: Those state-wide Census block groups that do not intersect “urbanized” areas as defined by the Census Bureau. There are no Census urbanized areas within the Scenic Area.

¹¹ Census Block Group: A geographical unit used by the U.S. Census Bureau to summarize data. On average, a block group contains between 600 and 3,000 people.



The growth rate of Washington and Oregon non-metro per capita incomes grew at different rates as well: 47% and 52% respectively. Therefore, it was harder for Oregon urban area incomes to maintain their lead over non-metro incomes that grew relatively quickly. And it was easier for the faster growing Washington urban area NSA incomes to catch up to the slower growing Washington non-metro incomes. By the end of the decade, both were either at or less than their state averages – unlike non-urban areas where NSA resident per capita incomes were above state-wide non-metro averages. See Vital Signs Indicator 3.3.a.

Per capita income change in urban areas varied widely between different counties. Urban area incomes in Klickitat County went up by 61%, followed by Skamania at 56%, Hood River at 50%, and Wasco at 36%. Neither Multnomah nor Clark counties have urban areas inside the NSA.

Between 1989 and 1999, some incomes in urban areas went up more slowly in relation to state averages than those in the NSA non-urban areas. See Vital Sign 3.3.a for more information.

Objective 3.1: Enhance and Sustain the Economic Vitality of the Urban Areas

Vital Sign Number: 3.1.b

Vital Sign Title: Job Growth

Vital Sign Measure: Net job growth: a) Oregon side; b) Washington side.

What We Know:

The table below shows short-term and long-term job growth for the four rural counties in the gorge. It also compares those figures to the statewide non-metropolitan job growth in Washington and Oregon. See endnote for data limitations.

Net Job Growth Inside the NSA Urban Areas			
State	Average county net jobs created per year 1992 - 2007	Average county net job growth <u>rate</u> 1992 - 2007	Average statewide non-metropolitan net job growth <u>rate</u> 1992 – 2007
a) Oregon side	323	2.1%	2.5%
b) Washington side	112	1.8%	2.3%

Assessment:

Over this period, Oregon side and Washington side counties have, on average, experienced similar job growth rates; with the Oregon side counties growing at a slightly faster rate (2.1%) than the Washington side (1.8%). However, the state average growth rate for the four gorge counties was significantly less than their respective states' non-metropolitan growth rates. The two Oregon counties combined rate of 2.1% per year between 1992 and 2007 is nearly ½ percentage point less than the 2.5% per year for Oregon. Similarly for Washington, the two gorge counties grew, on average, at 1.8% while non-metro Washington grew at 2.3% per year.

While growth rates for Washington and Oregon have been similar, job growth in the four individual counties has differed markedly. The two western counties, Hood River (2.8%) and Skamania (3.0%), outpaced their respective state averages. The two eastern counties, Wasco (1.4%) and Klickitat (1.1%) lagged far behind state averages. This may reflect the greater growth of tourism related jobs in the western counties, where the majority of overnight lodging in the Scenic Area is located.

Job growth figures show high variability in individual counties with as many as 800 jobs added and 500 jobs lost in a single year between 1992 and 2007.

Objective 3.1: Enhance and Sustain the Economic Vitality of the Urban Areas

Vital Sign Number: 3.1.c

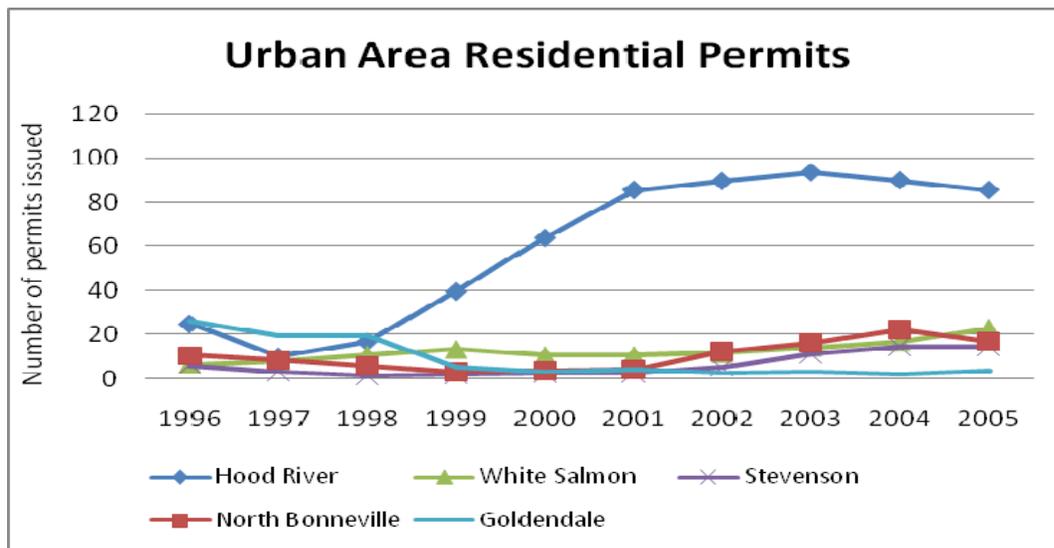
Vital Sign Title: Construction

Vital Sign Measure: Building permits issued, by urban area: a) housing, b) commercial, and c) industrial.

Proxy Measure: Number of residential building permits issued, by urban area.

What We Know:

Building permit data that differentiate between the types of permits described in 3.1.c or whether a site is in or out of the NSA or an urban area is not collected by county building departments at this time. The chart below shows residential building permit activity using data obtained from the U.S. Census Bureau – the most complete data available at this time. In order to “smooth” the data, each data point is a three-year average using the designated year as the mid-point.



Assessment:

All four gorge urban areas experienced significant increases in building permit activity between 2001 and 2005; the most recent year data are available. Hood River, on the other hand, saw dramatically higher permit activity beginning in 1999 and continuing through 2005. Generally counties were experiencing higher permit activity in 2005 than they had at anytime in the prior ten years. For comparison purposes, note that Goldendale, WA, which is outside of the NSA (and to the east), decreased from the mid-1990s and has remained very low since 2000.

Objective: Enhance and Sustain the Economic Vitality of the Urban Areas

Vital Sign Number: 3.1.e

Vital Sign Title: Housing Affordability

Vital Sign Measure: Percent of households that can afford the median priced house.

Proxy Measure:

Percent of renters and owners inside the NSA paying less than 30% of household income on rent or select monthly owner costs: a) Oregon side; and b) Washington side.

What We Know:

According to the Massachusetts Institute of Technology Center for Real Estate, the most common metric for housing affordability is the percent of household income spent on monthly housing costs. Generally, to be affordable, monthly costs should be less than 30% of income. The U.S. Census Bureau data on the percent of household income spent on rent or monthly owner costs has been summarized to the block groups that intersect the Scenic Area (NSA block groups) as well as to the entire counties that intersect the Scenic Area (all county block groups). The tables and graphs shown on the following pages show the approximate percent of households that have “affordable” monthly housing costs by renters and owners.

Assessment:

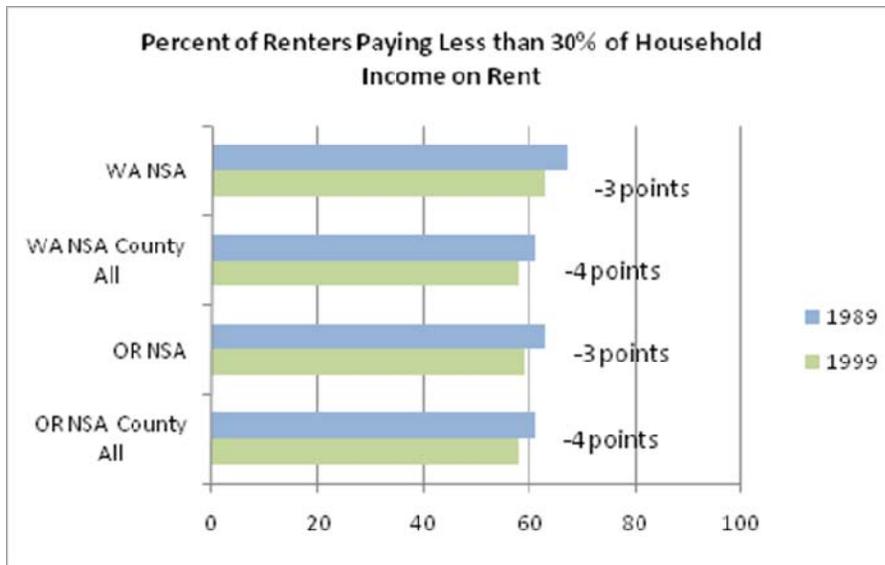
On average, housing affordability for both owners and renters has decreased for Scenic Area residents in both states between 1989 and 1999. For renters the affordability went down by four percentage points in both Oregon and Washington. Renting has also become less affordable at a similar rate throughout those counties that intersect the Scenic Area.

The affordability of home ownership in the Scenic area has also decreased but much more significantly between 1989 and 1999. Affordability has also decreased throughout the counties intersecting the Scenic Area, but at a lesser rate.

Affordability fell by nine percentage points in Oregon and a significant 15 percentage points in Washington. Washington-side homeowners inside the NSA saw a steeper decline in affordability than residents statewide. This is explained by a precipitous drop (34 percentage points) in ownership affordability in Clark County. At the same time renters in Clark County found renting significantly more affordable than average, while renters in Skamania and Multnomah Counties experienced just the opposite.

Renters:

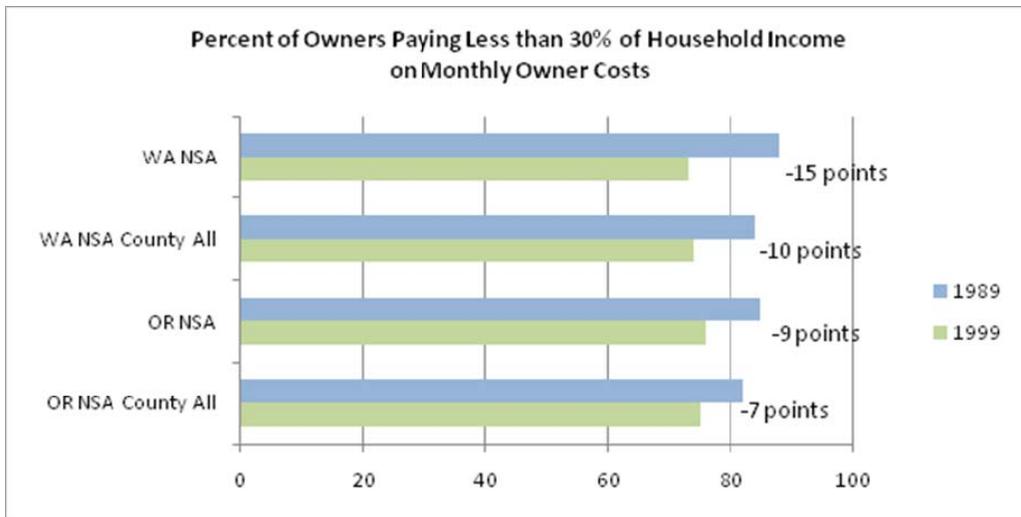
Percent of Renter Occupied Households Paying Less than 30% of Household Income on Rent				
County/State	1989		1999	
	NSA block groups	All county block groups	NSA block groups	All county block groups
Clark	53	63	80	59
Skamania	73	67	56	56
Klickitat	66	54	64	57
Multnomah	87	60	68	57
Hood River	60	60	61	63
Wasco	63	64	57	58
Oregon	63	61	59	58
Washington	67	61	63	58
NSA Overall	64	61	60	58



In general, the percent of renters residing inside the NSA urban areas that are paying less than 30% of their household income on rent is decreasing (from 64% in 1989 to 60% in 1999), meaning that it is becoming increasingly more expensive over time. However, when compared to the county block groups, renters in the NSA urban areas are paying less of their monthly income towards rent than those who live outside of the NSA.

Owners:

Percent of Owner Occupied Households Paying Less than 30% of Household Income on Select Monthly Owner Costs				
County/State	1989		1999	
	NSA block groups	All county block groups	NSA block groups	All county block groups
Clark	91	85	57	72
Skamania	87	84	76	76
Klickitat	89	82	75	75
Multnomah	80	81	73	72
Hood River	84	88	75	74
Wasco	87	87	77	77
Oregon	85	82	76	75
Washington	88	84	73	74
NSA Overall	86	83	75	74



Similar to NSA urban area renters, homeowners are on average, paying less of their monthly income towards owning a home than those who live outside of the NSA. However, the data shows that this trend may not continue for long. In 1989 three percent more NSA urban area homeowners paid less than 30% of their monthly income than the county block groups, and in 1999 there is a difference of only one percent.

Objective: Protect and Enhance Agriculture and Forestry

Vital Sign Number: 3.2.d

Vital Sign Title: Land Base

Vital Sign Measure: Total acreage in a) agriculture uses and b) forest uses*

* Forest uses are not addressed at this time.

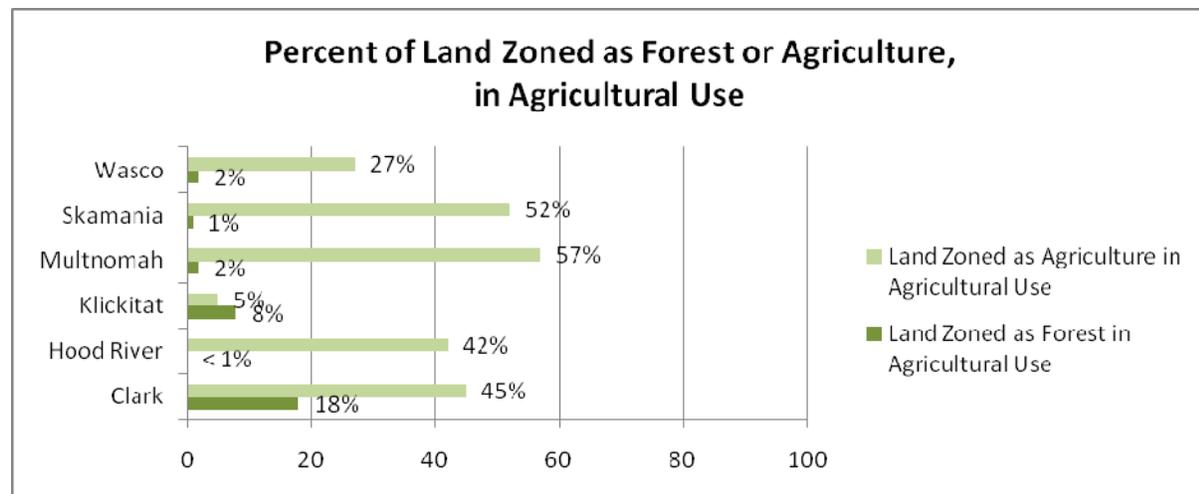
Proxy Measures:

- 1) Percent of land classified as agriculture¹² or pasture per agriculture and forest zoning.
- 2) Number of inventoried cattle and calves per [entire] county.

What We Know:

By combining land use designations and a 2004 USFS land cover classification, it is possible to estimate the amount of land that is designated forest or agriculture that was in agricultural use. See table below.

Percent of Land in Cultivation Based on Zoning						
County	Zoned as Agriculture			Zoned as Forestry		
	Acres Zoned as Agriculture	Acres in Agricultural Use	Percent in Agricultural Use	Acres Zoned as Forestry	Acres in Agricultural Use	Percent in Agricultural Use
Clark	3540	1602	45%	464	83	18%
Hood River	881	368	42%	7440	29	< 1%
Klickitat	39830	1867	5%	4394	370	8%
Multnomah	1629	922	57%	6788	135	2%
Skamania	4669	2445	52%	42830	504	1%
Wasco	25062	6868	27%	2315	51	2%



¹² Agriculture: Agricultural use in this context and according to the Management Plan can include cultivation of crops and pastures as well as cattle grazing.

Assessment:

In 2004, between 20-60 percent of land in each county within the Scenic Area that is zoned as agriculture was used for cultivation related agriculture, with the exception of Wasco County. For lands zoned as forest, the amount in cultivation ranges from less than 1% in Hood River County up to 18% in Clark County.

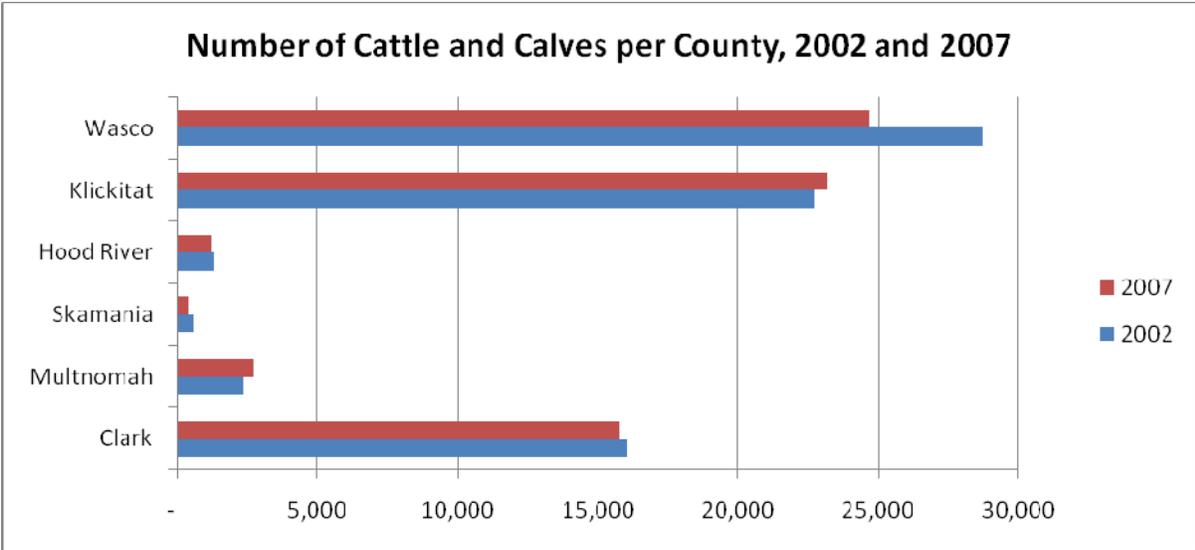
Most counties, with the exception of Wasco (27%) and Klickitat (5%), have approximately 50% of land zoned as agriculture in cultivation. As one may expect, there is little land zoned as forest in cultivation. However, Clark County has a significant percentage (18%) of forest land in cultivated use. Klickitat County has only 8% of its forest land in cultivated use but that is still a higher proportion than the 5% of its agriculturally zoned land in cultivated use.

These data establish a rough estimate for cultivated land by land use designation in the year 2004. However, future analysis will incorporate historic and current imagery as well as classification methods designed specifically to detect cultivation to create a more accurate picture of changes in agricultural use over time.

Grazing data are not readily available for lands within the Scenic Area; therefore Census of Agriculture data aggregated to the county level are used. The table below lists the number of animals per county as well as the number of farms raising cattle and calves.

Census of Agriculture, Inventory of Farms with Cattle and Calves				
	2002		2007	
County	Number of farms	Number of cattle and calves*	Number of farms	Number of cattle and calves*
Klickitat	267	22719	337	23223
Clark	693	16068	795	15799
Skamania	34	626	36	449
Hood River	95	1304	84	1235
Multnomah	159	2348	130	2764
Wasco	216	28779	270	24730

* Includes beef, milk and other cattle which includes pasture only cattle



The count of cattle and calves includes the beef and dairy sectors of the cattle industry. Beef production composes a significant portion of the agricultural economic sector in the eastern side counties of Wasco and Klickitat. The apparent trend between 2002 and 2007 for these counties is an increased number of farms and a decreased average of cattle per farm. However, the number of animals in each county remained relatively stable. The exception is Wasco County where the number of farms has increased by 24% while the average number of cattle per farm has decreased by 31%, resulting in a net decrease of more than 4000 animals. In Klickitat County the number of farms increased by 26% while average number of cattle per farm decreased by 19%.

Clark County, though considered an urban county, also has a significant cattle related agricultural sector. However, unlike the eastern counties whose cattle industry is related almost entirely to beef production, Clark County's industry was composed of 40% dairy production in 2007.

Objective: Allow Economic Development in Rural Centers and Non-Urban Areas Consistent with the Protection and Enhancement of the SNCR Resources

Vital Sign Number: 3.3.a

Vital Sign Title: Income

Vital Sign Measure: Per capita income of National Scenic Area non-urban area¹³ residents as a percent of non-metro¹⁴ per capita income: a) Oregon side; b) Washington side.

What We Know:

We can estimate NSA non-urban area per capita income by summarizing U.S. Census data to the block groups that do not contain significant portions of those urban areas. The table below shows the difference between non-urban area income and statewide non-metro income for 1989 and 1999.

Per Capita Income of NSA Non-Urban Area Residents as a Percent of Non-Metro						
	1989		%	1999		%
State	NSA Non-Urban Area	Statewide Non-Metro		NSA Non-Urban Area	Statewide Non-Metro	
Oregon	13,360	11,918	112%	21,092	18,057	117%
Washington	12,809	12,459	103%	18,756	18,280	103%

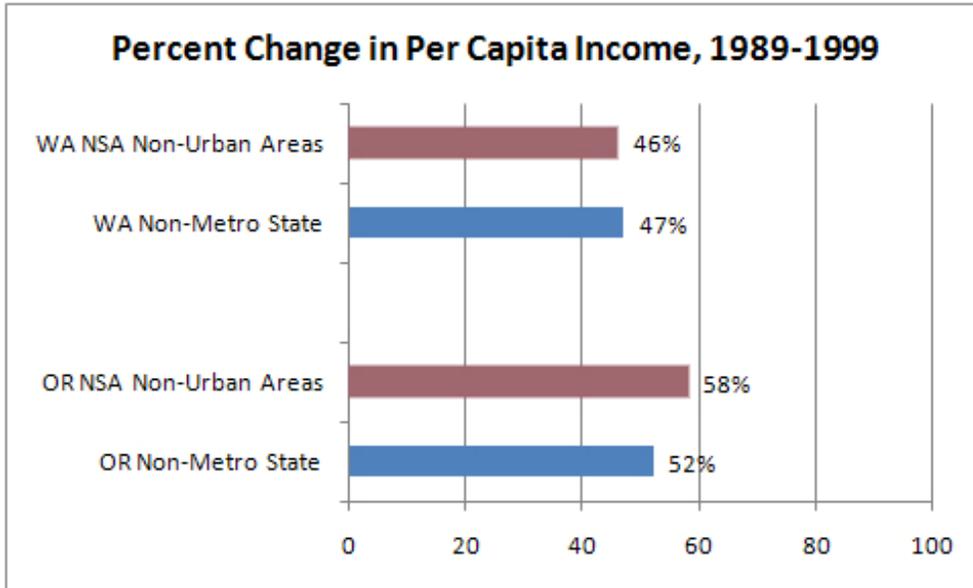
Assessment:

Relative to state-wide non-metro averages, per capita income in the NSA non-urban areas of Oregon grew at a faster rate while income in the NSA non-urban areas of Washington grew at almost the same rate. In 1989, Oregon non-urban area incomes were approximately 112% of state-wide non-metro incomes and grew to 117% by 1999. Washington non-urban area income held steady at 103% of non-metro state income in both 1989 and 1999.

¹³ NSA Non-Urban Area: Those Census block groups that intersect the National Scenic Area but do not significantly intersect the 13 National Scenic Area Urban Areas as defined by Congress and amended by the Gorge Commission.

¹⁴ State non-metro: Those state-wide Census block groups that do not intersect “urbanized” areas as defined by the Census Bureau. There are no Census urbanized areas within the Scenic Area.

The growth rate of Washington and Oregon non-metro per capita incomes grew at different rates between 1989 and 1999: 47% and 52% respectively. The higher growth rate in Oregon was exceeded by the NSA non-urban areas, resulting in an ever greater lead over state non-metro average income.



Per capita income change in the NSA non-urban area varied widely between different counties. Non-urban area per capita incomes in Multnomah County increased by 78% followed by Klickitat at 65%, Skamania at 49%, Clark at 38%, Hood River at 36%, and Wasco at 30%.

Between 1989 and 1999, some incomes in NSA urban areas went up more slowly in relation to state averages than those in the NSA non-urban areas between 1989 and 1999. See Vital Sign 3.1.a for more information.

Objective 3.3: Allow Economic Development in Rural Centers and Non-Urban Areas Consistent with the Protection and Enhancement of the SNCR Resources

Vital Sign Number: 3.3.c

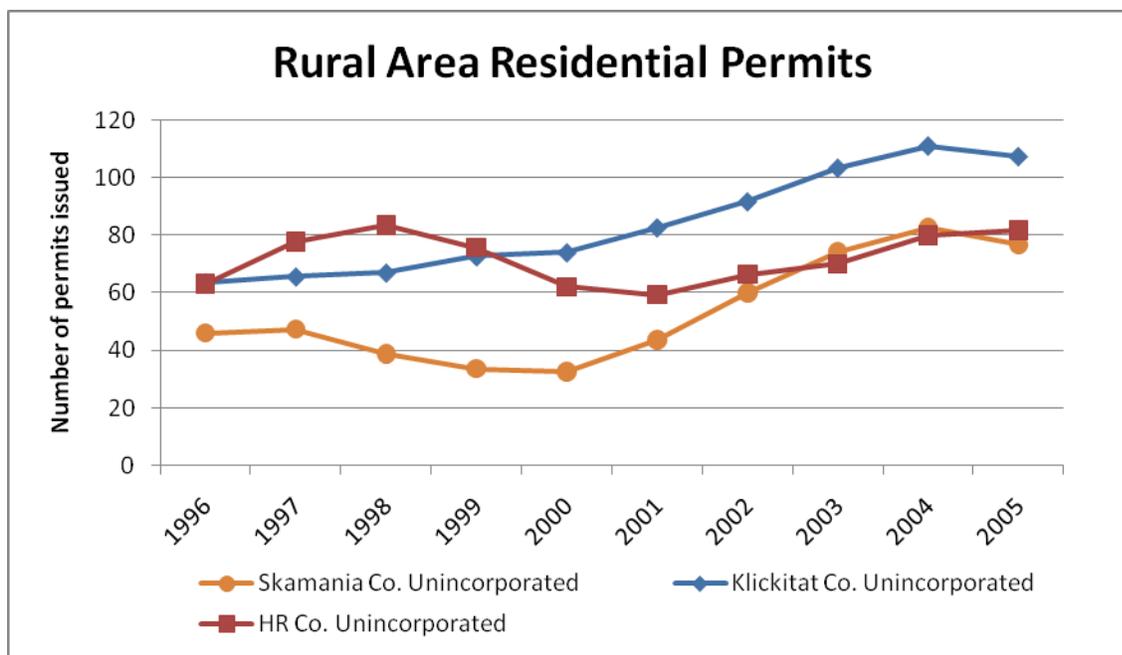
Vital Sign Title: Construction

Vital Sign Measure: Building permits issued in rural centers and non-urban areas: a) housing, b) commercial, and c) agricultural.

Proxy Measure: Number of residential building permits issued in unincorporated portions of rural NSA counties.

What We Know:

Building permit data that differentiate between the types of permits based on whether a site is in or out of the NSA is not collected by gorge building departments at this time. The chart below shows residential building permit data obtained from the U.S. Census Bureau. These data represent a three-year rolling average of each year's data, in order to smooth out the curves. It is the most complete dataset at this time. These data are not reported for Wasco County. Clark County and Multnomah County were not included due to the small size of the NSA portions of both counties.



Assessment:

Overall, annual construction rates have increased over time for NSA rural areas. Construction slumped around 2000, but three counties rebounded by 2004. The increase in rural building activity was much stronger in the early part of the decade for Washington NSA counties than the trend for unincorporated Hood River County. This is the inverse of the urban area data which show the City of Hood River growing at a much faster rate during this period than other gorge urban areas.

Economy Chapter Endnotes:

3.1.a Income

Source: U.S. Census Bureau, 1990 and 2000 surveys.

NSA data are summarized to the block groups that intersect the National Scenic Area. Because the block groups do not align with the Scenic Area boundary, information for areas outside the boundary may be included. Those block groups that significantly intersected the Scenic Area boundary were designated as “NSA.” Those block groups that fell outside the Census delineated urbanized areas were designated as “non-metro.” NSA block groups that contained significant portions of the Scenic Area urban areas were designated as “urban area” block groups.

3.1.b Job Growth

Source: Quarterly Workforce Indicators program of the U.S. Census Bureau:
<http://lehd.did.census.gov/led/datatools/qwiapp.html>.

Job growth data for the small portions of Clark County and Multnomah County in the National Scenic Area (NSA) are not available from any known source.

3.1.c Construction

Source: U.S. Bureau of the Census Building Permit Estimates - U.S., State, and Metropolitan Areas:
<http://censtats.census.gov/cgi-bin/bldgprmt/bldgdisp.pl>

3.1.e Housing Affordability

Source: U.S. Census Bureau, 1990 and 2000 surveys.

NSA data are summarized to the block groups that intersect the National Scenic Area. Because the block groups do not align with the Scenic Area boundary, information for areas outside the boundary may be included.

3.2.d Land Base - Agriculture use

Source: Land cover classification based on 2004 satellite imagery, USFS, CRGC.
Land use designations, 2008, CRGC.

Cattle and Calves: Inventories and Sales, USDA Census of Agriculture, 2002, 2007.

The spatial resolution of this imagery is 30 meters. There are 20 land cover classes identified, with 15 related to forest and shrub. The Ag/Golf/Pasture class was isolated and reviewed by using 2005 and 2006 aerial photographs at a coarse scale of approximately 1:24,000. Golf courses and other obvious non-agriculture areas (i.e. lawns) were removed from this class. The resulting data were combined with the forest and agricultural related land use designations and summarized. For the next report, staff hopes to have an improved evaluation of agricultural uses based in Landsat 7 ETM+ image classification. Free historic imagery as well as more recent raw imagery will be provided by the Forest Service for the new evaluation.

Grazing land use cannot be assessed with imagery and will instead be tracked through grazing permits, owner class and other information. Census of Agriculture 2002 and 2007 data were used to compute statistics on cattle inventories for this report. Sub-county data are not available.

3.3.a Income

Source: U.S. Census Bureau, 1990 and 2000 surveys.

NSA data are summarized to the block groups that intersect the National Scenic Area. Because the block groups do not align with the Scenic Area boundary, some information for areas outside the boundary may be included.

Those block groups that significantly intersected the Scenic Area boundary were designated as “NSA.” Those block groups that fell outside the Census delineated urbanized areas were designated as “non-metro.” Though all NSA block groups are outside Census urbanized areas, those block groups that did not contain a significant portion of an NSA defined “urban area” were designated as “rural NSA.”

3.3.c Construction

Source: U.S. Bureau of the Census Building Permit Estimates - U.S., State, and Metropolitan Areas:
<http://censtats.census.gov/cgi-bin/bldgprmt/bldgdisp.p>

Please see www.gorgevitalsigns.org for more information.



Peter Marbach



Columbia River Gorge Commission



Joanna Grammon



Michael J. Hatten

Goal 4

Protect and enhance cultural resources

Cultural resources are the evidence of past human activities that are important in history, archaeology, architecture or culture of a community or region. A rich and diverse array of cultural resources exist in the gorge, ranging from 10,000-year-old stone tools to log cabins built by pioneers to vision quest sites still used today by Native Americans. The objectives were written to encompass the three groups of cultural resources, as defined below. For each objective, measures were created to monitor the general conditions, inventory existing information and to facilitate future surveys for public and stakeholder awareness.

Objectives:

4.1 PROTECT AND ENHANCE SIGNIFICANT ARCHAEOLOGICAL RESOURCES

The physical remains or ruins of past generations, such as the remains of a rock shelter, an Indian village, or a pioneer settlement. Other examples include petroglyphs, graves, and artifacts like arrowheads and utensils.

4.2 PROTECT AND ENHANCE SIGNIFICANT HISTORIC RESOURCES

Standing buildings and structures that are at least 50 years old, including log cabins, barns, highways and wagon trails.

4.3 PROTECT AND ENHANCE SIGNIFICANT TRADITIONAL CULTURAL PROPERTIES

Objects and places associated with beliefs and practices of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Traditional cultural properties may include a location used by past and present generations of Native Americans for ceremonial purposes or an area where a community has traditionally conducted culturally important economic or artistic activities.

Objective: Protect and Enhance Significant Archaeological Resources

Vital Sign Number: 4.1.a

Vital Sign Title: Condition

Vital Sign Measure: Percent of all monitored archaeological sites in good condition.

Proxy Measure: Percent of assessments of effect¹⁵ per year resulting in an adverse effect finding.

What We Know:

No assessments of effect resulted in an adverse effect finding in 2007 and 2008.

Number of Assessments of Effect on Significant Archeological Resources Conducted		
	2007	2008
Adverse Effect – no resolution	0	0
Adverse Effect – resolved through mitigation	0	0
No Adverse Effect ¹⁶	1	16
No Effect ¹⁷	0	2
Total Assessments	1	18

Percent Resulting in an Adverse Effect Finding	0	0
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Assessment:

Archaeological resources are physical evidence of past human activity that is an important part of the history of the region. In order to measure the health of archaeological resources in the Scenic Area, one has to know their condition and the change in their condition over time. This indicator was intended to track the physical condition of archaeological resources in the Scenic Area.

Currently, no standard rating of condition is applied to cultural resources in the gorge. Other than “no adverse effect,” staff and project advisers could not reach consensus on a definition of “good condition” for cultural resources. For this reason, the proxy of assessment of effect of proposed developments was used.

An assessment of effect occurs if a proposed land use could potentially affect a significant cultural resource. The assessment determines whether the use would: 1) adversely affect the resource with no way to resolve; 2) adversely affect the resource but with resolution through mitigation; 3) insignificantly affect the resource or 4) have no effect at all. A proposed use is considered to have an adverse effect on a cultural resource when it would alter or destroy characteristics that make the resource significant. Assessments of effect also are conducted when an action, other than a proposed land use, is thought to have had an effect on a cultural resource (e.g. unpermitted construction, train derailment). The table above shows that none (0%) of the assessments of effect conducted in 2007 and 2008 indicated an adverse result would occur from development or other actions.

¹⁵ The number of assessments of effect conducted each year is driven by new project applications. The number and type of applications can vary widely from year to year.

¹⁶ No adverse effect means that the action had some effect on the resource, but that it was not significant.

¹⁷ No effect means that the action had no effect on the resource.

For future reports, staff hopes to develop a comprehensive monitoring program that tracks the condition of an established set of archaeological resources. This program would be developed using a peer review group that includes cultural resource professionals.



Brian Litt

Objective: Protect and Enhance Significant Archaeological Resources

Vital Sign Number: 4.1.d

Vital Sign Title: Inventory

Vital Sign Measure: Number of new significant archaeological resources identified each year.

What We Know:

An average of five new significant archaeological resources is identified each year.

Inventory of Significant Archaeological Resources		
	1988	2008
Sites Listed in the National Register of Historic Places	2	3
Sites Eligible for Listing on the National Register of Historic Places	14	117
Total	16	120

Assessment:

Archaeological resources are physical evidence of past human activity that is an important part of the history of the region. Archaeological resources cannot be protected without knowing where they are and what they are. This indicator tracks the growing inventory of archaeological resources that provides the basis for protection.

Sites are considered significant if they are either listed on the National Register of Historic Places or eligible for listing. Between 1988 and 2008, 104 significant sites were identified. The number of sites identified per year is not available for past data but the average is approximately five per year.

In 1988, the first inventory of archaeological resources in the Scenic Area was compiled. The 1988 inventory includes fourteen archaeological sites that contribute to an archaeological district on the National Register and two other sites that are individually listed on the National Register. Since 1988, one additional archaeological resource has been included on the National Register of Historic Places and 103 additional archaeological resources have been identified as eligible for inclusion on the register. Significant archaeological resources include village sites, burial sites, rock features, petroglyphs, and pictographs. Archaeological resources are identified primarily during the development review process when reconnaissance surveys are required for most development proposals involving ground disturbance and for all proposed uses within 500 feet of a known cultural resource.

Objective: Protect and Enhance Significant Historic Resources

Vital Sign Number: 4.2.a

Vital Sign Title: Condition

Vital Sign Measure: Percent of all monitored historic resources in good condition.

Proxy Measure: Percent of assessments of effect per year resulting in an adverse effect finding.

What We Know:

No assessments of effect resulted in an adverse effect finding in 2007 and 2008.

Number of Assessments of Effect on Significant Historic Resources Conducted		
	2007	2008
Adverse Effect – no resolution	0	0
Adverse Effect – resolved through mitigation	0	2
No Adverse Effect	4	9
No Effect	2	3
Total Assessments	6	14

Percent Resulting in an Adverse Effect Finding	0	0
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Assessment:

Historic resources provide physical evidence of the history of past generations and architecture of the Scenic Area. Loss or deterioration of historic resources diminishes our connection to the past. This indicator was intended to measure the condition of historic resources in the Scenic Area and the change in their condition over time.

Currently, no standard rating of condition is applied to cultural resources in the gorge. Other than “no adverse effect,” staff and project advisers could not reach consensus on a definition of “good condition” for cultural resources. For this reason, the proxy of assessment of effect of proposed developments was used.

An assessment of effect occurs if a proposed land use could potentially affect a significant cultural resource. The assessment determines whether the use would: 1) adversely affect the resource with no way to resolve; 2) adversely affect the resource but with resolution through mitigation; 3) insignificantly affect the resource or 4) have no effect at all. A proposed use is considered to have an adverse effect on a cultural resource when it would alter or destroy characteristics that make the resource significant. Assessments of effect also are conducted when an action, other than a proposed land use, is thought to have had an effect on a cultural resource (e.g. unpermitted construction). The table above shows that none (0%) of the assessments of effect conducted in 2007 and 2008 indicated an adverse result would occur from development or other actions.

For future reports, staff hopes to develop a comprehensive monitoring program that tracks the condition of an established set of historic resources. This program would be developed using a peer review group that includes cultural resource professionals.

Objective: Protect and Enhance Significant Historic Resources

Vital Sign Number: 4.2.d

Vital Sign Title: Inventory

Vital Sign Measure: Number of new significant historic resources identified each year.

What We Know:

An average of three new significant historic resources is identified each year.

Inventory of Significant Historic Resources		
	1988	2008
Sites Listed on the National Register of Historic Places	35	40
Sites Eligible for Listing on the National Register of Historic Places	0	61
Total	35	101

Assessment:

Historic resources provide physical evidence of the history of past generations and architecture of the Scenic Area. Historic resources cannot be protected without knowing where they are and what they are. This indicator tracks the growing inventory of historic resources that provides the basis for protection.

Sites are considered significant if they are either listed on the National Register of Historic Places or eligible for listing. Between 1988 and 2008, 66 significant sites were identified. The number of sites identified per year is not available for past data, but the average is approximately three per year.

In 1988 the first inventory of historic resources in the Scenic Area was compiled. Since 1988, five historic resources have been included on the National Register of Historic Places and 61 historic resources have been identified as eligible for inclusion on the register. They include standing structures and buildings that are at least 50 years old, such as cabins, homes, barns, roads, bridges, and tunnels. Historic resources are identified primarily during the development review process when historic surveys are required for developments that would alter the exterior of buildings and structures that are at least 50 years old, or that would compromise features of the surrounding area that define the historic or architectural character of such buildings or structures.

Cultural Chapter Endnotes:

4.1.a Condition

Source: Margaret L. Dryden, Heritage Resources Program Manager, Columbia River Gorge National Scenic Area, USDA Forest Service.

While no comprehensive monitoring program in the Scenic Area to track the condition of archaeological resources exists, several on-going monitoring efforts include: checking known cultural resources, primarily on Forest Service lands, to determine if any change in conditions has occurred; checking known sites on private lands to assess compliance with conditions of a land use decision; monitoring of known sites with critical issues on Forest Service lands; monitoring during construction in cases of deep excavation; monitoring pictographs as part of a 50-year study for the Forest Service; and monitoring known cultural resource sites along the shorelines of the Columbia River by the U.S. Army Corps of Engineers as part of the Bonneville and The Dalles Dam projects.

4.1.d Inventory

Source: Margaret L. Dryden, Heritage Resources Program Manager, Columbia River Gorge National Scenic Area, USDA Forest Service

Notes: 1) archaeological sites listed on the National Register of Historic Places as part of an historic district also can be listed individually, 2) the Forest Service database of known archaeological resources includes sites that have not been evaluated for eligibility on the National Register of Historic Places. Sites that have not been evaluated are not included in this inventory of significant sites and 3) Data is reported by federal fiscal year. The inventory includes the number of resources identified *through* 1988 and 2008 respectively.

4.2.a Condition

Source: Margaret L. Dryden, Heritage Resources Program Manager, Columbia River Gorge National Scenic Area, USDA Forest Service.

Note: The demolition of an historic structure can be assessed as “no adverse effect” if the structure’s significant features and historical importance are carefully documented prior to its demolition. In this sense, an assessment of effect does not provide a comprehensive evaluation of the *condition* of the resource.

4.2.d Inventory

Source: Margaret L. Dryden, Heritage Resources Program Manager, Columbia River Gorge National Scenic Area, USDA Forest Service.

Notes: 1) The Forest Service database of known historic resources includes sites that have not been evaluated for eligibility on the National Register of Historic Places. Sites that have not been evaluated are not included in this inventory of significant resources and 2) Data is reported by federal fiscal year. The inventory includes the number of resources identified *through* 1988 and 2008 respectively.

Please see www.gorgevitalsigns.org for more information.



Dawn Nielson



Hood River Waterplay



Stephen Datnoff

Goal 5

Protect and enhance recreation resources

With its breathtaking panoramic views, awesome waterfalls, towering cliffs, multitude of aquatic resources, historic highways and dramatically diverse terrain, the Columbia River Gorge National Scenic Area has provided outdoor recreation opportunities for many decades. In more recent years, the recreation identity of the gorge has expanded from driving, hiking and boating to include windsurfing, kiteboarding, kayaking, rafting, and mountain and road biking. With an increase in recreation types and in general, more users, overcrowding of sites and environmental degradation have become larger issues. A key question facing the gorge today is: how can we all share in the experience, without loving the gorge to death? The objectives and measures have been written to address this question.

Objectives:

5.1 ADDRESS THE DEMAND FOR RESOURCE-BASED RECREATION OPPORTUNITIES IN AN ENVIRONMENTALLY SUSTAINABLE MANNER

Assessing the impacts of existing resource-based recreation on the natural environment as well as the demand for additional sites to improve user access.

5.2 PROTECT AND ENHANCE THE QUALITY OF RECREATION EXPERIENCES

Documenting the overall quality of the gorge recreation experience as reported by both visitors and residents.

Objective: Address the Demand for Resource-based Recreation Activities in an Environmentally Sustainable Manner

Vital Sign Number: 5.1.a

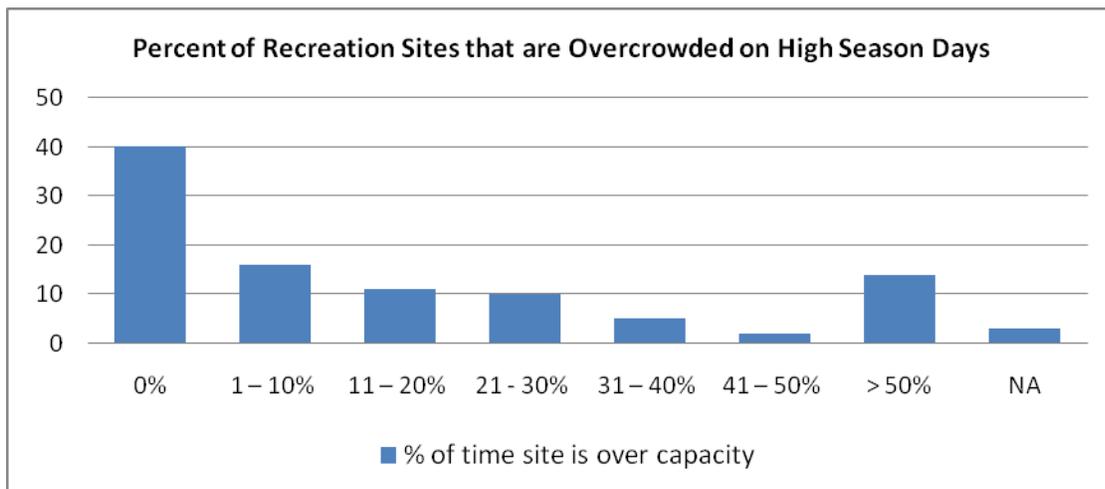
Vital Sign Title: Recreation Demand

Vital Sign Measure: Percent of recreation sites at or above capacity more than X percent of the time on high season days - total and by recreation activity type.

Proxy Measure: Percent of surveyed recreation sites above capacity more than 30 percent of the time on high season days.

What We Know:

Twenty-one percent of sites were at or above capacity more than 30% of the time during the high season in 2008.



Assessment:

In late 2008 managers of approximately 180 recreation sites in and near the NSA responded to an online survey requesting information on site use. The Commission has not agreed on a figure that would represent an overused site. The definition of overcrowded for this analysis is “above capacity 30% of the time” on high season days. Three sites related to water sports were assessed to be at or above capacity 80% of the time on high season days. An additional nine percent said their sites were at or above capacity 20% of the time. Conversely, 40% of all sites were not ever at or above capacity. See the endnote for more information.

Objective: Address the Demand for Resource-based Recreation Activities in an Environmentally Sustainable Manner

Vital Sign Number: 5.1.b

Vital Sign Title: Environmentally Sustainable Recreation

Vital Sign Measure: Percent of recreation sites that are environmentally degraded - total and by recreation activity type and specified as improving or not improving.

Proxy Measure:

1) Percent of each surveyed recreation site that is more than 10% environmentally degraded as a result of human activity and 2) percent that are a) improving, b) not changing, and c) worsening.

What We Know:

Regarding measure 1) - the percent of sites degraded, the chart below shows that, according to survey respondents, 21% of all sites are more than 10% degraded as a result of human activity.

Percent of Sites at Different Environmental Degradation Levels	
Percent of a site that is environmentally degraded by human activity	Percent of sites at each degradation level
0 % degraded	27
1 – 10% degraded	50
11 – 20% degraded	11
21 – 30% degraded	6
31 – 40% degraded	0
41 – 50% degraded	1
Greater than 50% degraded	3
Not Applicable	1

Regarding measure 2) - the percent of sites improving, worsening and not changing, the chart below shows that seven percent of sites are improving, 76% of sites are not changing and 17% of sites are worsening.

Degradation Trend for Recreation Sites	
Surveyed recreation sites that are:	Percent
a) improving	7
b) not changing	76
c) worsening	17

Assessment:

In late 2008 managers of approximately 180 recreation sites in and near the NSA responded to an on-line survey requesting information on site use. One hundred twenty-nine responded to this question. The Commission has not yet agreed on a figure that would represent significant degradation. The standard for significant degradation for this analysis is 10%. Clearly, the large majority of sites are in good and stable condition with less than five percent at what might be considered a highly degraded level.

Litter, trail erosion, soil compaction and devegetation led the list of types of degradation. Some respondents also noted that weeds and Columbia River-caused erosion were indirect forms of human-caused degradation.

Objective: Address the Demand for Resource-based Recreation Activities in an Environmentally Sustainable Manner

Vital Sign Number: 5.1.d

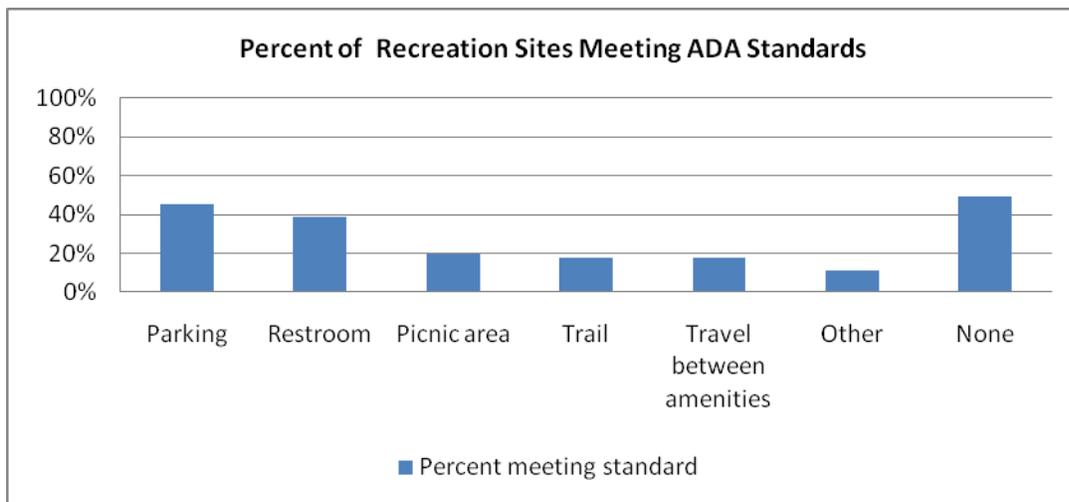
Vital Sign Title: ADA Accessibility

Vital Sign Measure: Percent of recreation sites that meet ADA standards - total and by recreation activity type.

Proxy Measure: Percent of surveyed recreation sites that meet one or more ADA accessibility standards.

What We Know:

Nearly half of the surveyed recreation sites met ADA standards.



Assessment:

In late 2008 managers of approximately 180 recreation sites in and near the NSA responded to an on line survey requesting information on site use. All respondents answered this question. For the most basic accessibility issue – parking – nearly half of all the sites meet ADA standards. We also know that 39% of all sites (or 70) have an accessible restroom. About 20% of sites (or 35) have accessible picnic areas and trails. And about 20% of the sites are constructed in such a way that individuals with disabilities can travel between amenities. Other amenities listed include access to: campsites, viewpoints, a petroglyph interpretive display, drinking fountains, covered kitchen and fishing area. Conversely, one-half of all sites have no ADA amenities. Since the survey did not establish a baseline for the total number of restrooms, trails and picnic areas, it cannot tell us what percent of each type of amenity in the gorge is accessible. See the endnote for more information.

Objective: Protect and Enhance the Quality of Recreation Experiences

Vital Sign Number: 5.2.b

Vital Sign Title: Recreation Site Quality

Vital Sign Measure: Percent of site users rating their overall experience as good or better – total and by recreation site.

What We Know:

In general, the number of recreation users who would rate their experience as good or better has increased.

Users Rating Their Overall Recreation Experience as Good or Better					
Recreation Site	1997	2001	2005	2006	Percentage Point Change
The Dalles Lock and Dam – Celilo Lake			97%	89%	- 8

Average User Rating for Overall Recreation Experience					
Recreation Site	1997	2001	2005	2006	Change
US Forest Service Facilities, Overall (Reported as the median score averaged (scale of 1 – 5) over all survey questions.)		4.2		4.5	0.3
Bonneville Lock and Dam (Reported as overall average percent satisfaction.)	74%				
Overall	NA	NA	NA	NA	NA

Assessment:

There is a lack of information available on site-user satisfaction across the broad range of recreation providers in the gorge. Although no neutral or general gorge recreation user information currently exists, survey data from two providers were found. Fortunately the largest gorge recreation provider by far - the U.S. Forest Service - has the most complete and up-to-date information on user satisfaction. Rankings for Forest Service site users were obtained in 2001 and 2006. The average ranking for all services (the survey did not ask an overall quality question) improved significantly between 2001 and 2006. Areas with the largest gains included facility quality, employee helpfulness, trail conditions, feeling of safety, restroom cleanliness and road condition.

Using information provided by the U.S. Army Corps of Engineers, another large recreation provider in the gorge, The Dalles Dam received high rankings for individual characteristics, yet its overall ranking dropped significantly between 2005 and 2006. The overall ranking for Bonneville, last reported in 1997, shows an average ranking of 74%. However, the scale for this survey uses “very satisfied” and

“extremely satisfied” which could be considered more demanding than the “good or better” used for this Vital Signs Indicator.

The Forest Service data provides the most complete information on overall quality. With an average ranking for quality of 4.5 out of 5.0, the survey reveals a substantially positive recreation experience and shows an improving trend. The quality of scenery, received a near-perfect ranking. See the endnote for more information.

The existing surveys used to make this assessment differed significantly from one another. Some were scientific surveys conducted by interviews while others were compilations of self-reported user comment cards. Most reported average or median user scores. Only one site, The Dalles Dam, reported the actual percentages of user responses by level of satisfaction. All used a five-point scale for satisfaction making rough comparisons possible.



Joanna Grammon

Recreation Chapter Endnotes:

5.1.a Recreation Demand

Source: Gorge Commission survey of recreation providers.

Gorge Commission staff attempted to identify every gorge area recreation site, both public and private – 231 in all. Not all providers were inside the NSA. The 78% response rate was above staff expectations. Managers of those sites were asked to take a brief survey regarding demand, degradation and handicapped accessibility. Results can be viewed at:
http://www.surveymonkey.com/sr.aspx?sm=vvE2d9WCvuVO7erjufFWESmhEYIGqZ6RKePunsZUzkE_3d

Due to survey limitations, the sites are not categorized by recreation type.

5.1.b Environmentally Sustainable Demand

See 5.1.a: Recreation Demand endnote above.

5.1.d ADA Accessibility

See 5.1.a: Recreation Demand endnote above.

5.2.b Recreation Site Quality

Sources:

Recreationists in the Columbia River Gorge National Scenic Area: A Survey of User Characteristics, Behaviors and Attitudes, Prepared by Alan R. Graefe, Robert C. Burns and Karen Robinson for the U.S. Forest Service in 2001

National Visitor Use Monitoring Results for Columbia River Gorge National Scenic Area, data was collected by the U.S. Forest Service in 2006

National Visitor Use Monitoring Results: September 2001, USDA Forest Service, Region 6, Columbia River Gorge National Scenic Area, U.S. Forest Service in 2001

US Army Corps of Engineers Recreational Customer Satisfaction Survey; Volume 3: Bonneville Lock and Dam, Alan R. Graefe, Robert C. Burns, John Titre, and James Absher, 1999.

Comment Card Submissions from The Dalles Lock and Dam – Lake Celilo (2004 – 2008), U.S. Army Corps of Engineers

Commission staff attempted to contact all known recreation providers to determine if they had user survey information. The three providers cited in this report were the only ones responding positively. A summary of the survey results can be found at:
http://www.surveymonkey.com/sr.aspx?sm=vvE2d9WCvuVO7erjufFWESmhEYIGqZ6RKePunsZUzkE_3d.

More information on the surveys including breakdowns regarding particular types of services will be made available on the Vital Signs Indicators web page at www.gorgevitalsigns.org.



Skamania Lodge

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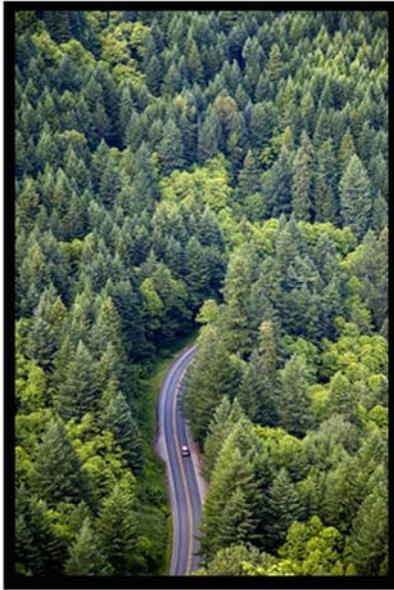
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Doug Crow, former Gorge Commissioner



Highway 14 by Sikora Photography



Dog Mountain Wildflowers by John McSherry



Horsethief Butte by Mike McDonald