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 buildings[1], as seen from selected public vantage points[2], 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 impaired[3] 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

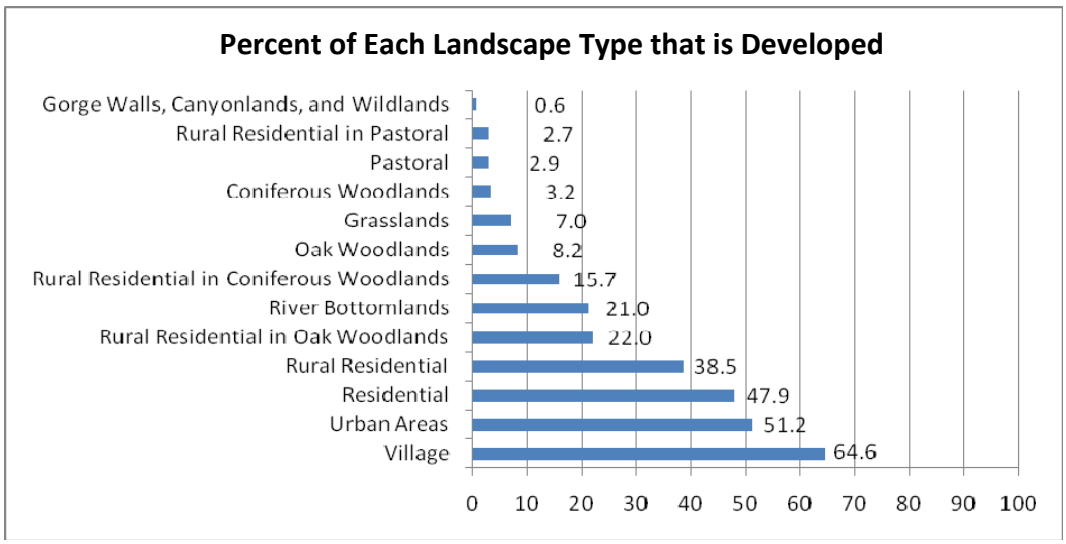
Vital Sign Number: 1.2.b

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 development[4] 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 Areas[5]". 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 glace 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.)

Peter Marbach

Joanna Grammon

Michael J. Hatten