

**Historic Columbia River Highway State Trail
Viento State Park to Mitchell Point
(Segments E&F) ODOT Key # 20677
Mitigation Report**

Hood River County, Oregon



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Executive Summary

The Historic Columbia River Highway State Trail (HCRHT) is connecting abandoned segment of the Historic Columbia River Highway (HCRH) from Troutdale to The Dalles to create a state trail. The proposed Viento State Park to Mitchell Point is part of this larger effort and represents one of the final pieces for the trail. The purpose of the trail is to connect abandoned portions of the HCRH and provide a quality trail experience

This Mitigation Plan has been prepared because the proposed development will impact natural resources or their buffers within the Columbia River Gorge National Scenic Area (CRGNSA) for Segments E and F of the HCRHST.

The HCRHT from Viento State Park to Mitchell Point Drive (Segments E-F) was located and designed to avoid and minimize impacts within the Columbia River Gorge while still achieving the project purpose. Part of the purpose was to connect the abandoned sections of the HCRH. The least impacting route was along I-84. Most of the trail (84%) was located within either the avoidance alternative or low impact alternative. These areas included the existing HCRH (48%), existing roadway embankment (12%) or was along I-84 (24%). Some of the route was within historically disturbed areas and considered to be a low impact alternative that improved the trail experience by moving the trail away from I-84 (10%), or was associated with connecting I-84 segments with existing HCRH segments (3%). Of the areas connecting I-84 to existing HCRH Segments, only a small portion of the trail (2%) was located within relatively undisturbed forest. Finally 3% will be located within a new tunnel through Mitchell point.

The trail will directly impact 2.05 acres of natural resources including streams, Oak woodlands, and cliffs. Stream impacts are small and the restoration at the Roadhouse Mitigation Site will mitigate for these impacts. Oak woodlands will be mitigated by a combination of Oak Opening (conifer removal) and plantings at the Mitchell Point Quarry Site, Chetwoot Loop Site, Perham Creek, Stepped Cut, and Viento Maintenance Facility. The trail will also impact 10.34 acres of natural resource buffers. The Roadhouse Site, Sonny Site, Dome Rock and Viento Campground mitigation sites provide 10.98 buffer impacts.

1. Introduction

The Historic Columbia River Highway State Trail (HRCHT) is connecting abandoned segment of the highway from Troutdale to The Dalles. The proposed Viento State Park to Mitchell Point Drive is part of this larger effort and represents the second to last construction project for the trail (Figure 1). The purpose of the trail is to connect abandoned portions of the Historic Columbia River Highway (HCRH) and provide a quality trail experience.

This Mitigation Report has been prepared because the proposed trail will impact natural resources and their buffer within the Columbia River Gorge National Scenic Area. This Mitigation Plan has been prepared because the proposed development is within a natural resource or buffer within the Columbia River Gorge National Scenic Area (CRGNSA). This report covers segments E and F of the HRCHT.

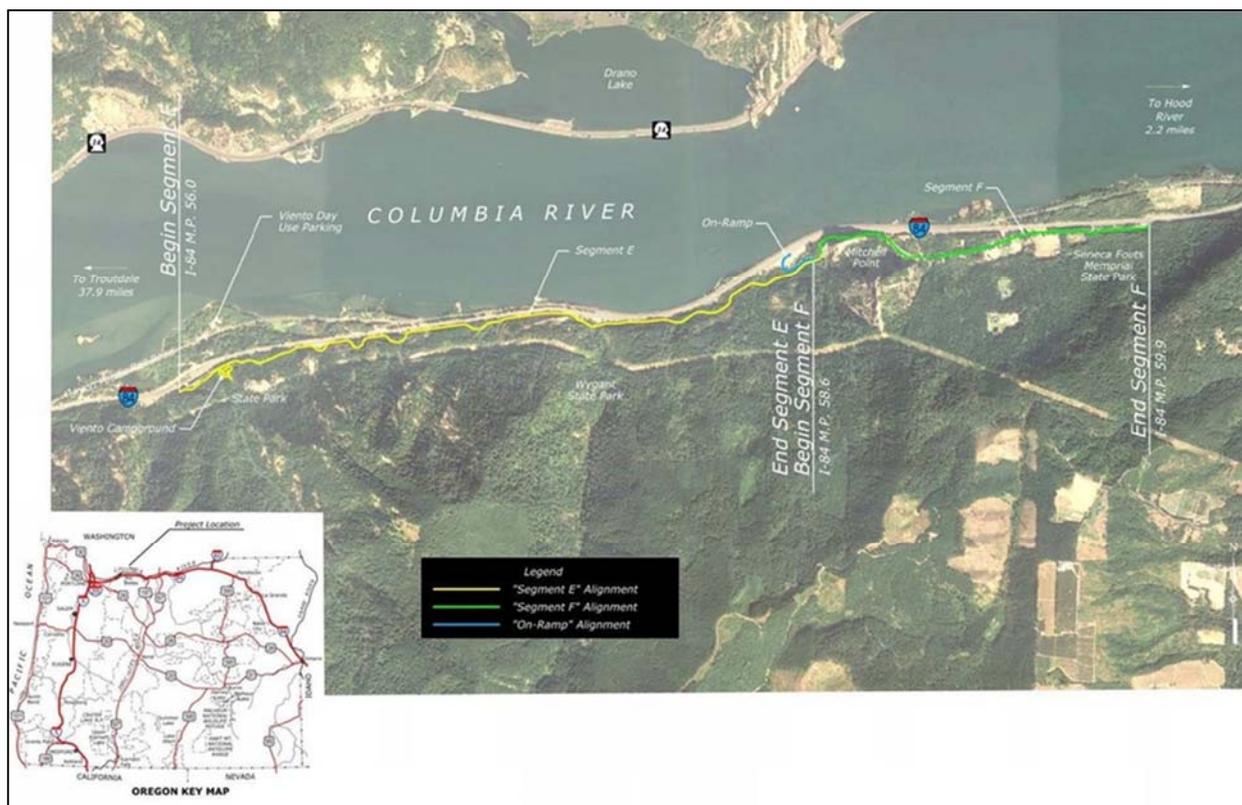


Figure 1. Project Alignment

2. Trail Placement-Avoidance

The HRCHT's purpose is to connect portions of the HCRH and provide a quality trail experience for its users. In alignment with the original HCRH, the trail's route was selected to have a light touch on the environment within the Columbia River Gorge while achieving the project purpose. Minimizing project impacts to natural resources counterbalanced with trying to provide a quality trail experience drove the trail location. Impacts to natural resources were avoided by locating the trail on existing portions of the HCRH, whenever possible. In other areas where potential conflicts with streams occurred, the trail was placed within existing disturbance areas and for new crossings, full span bridges were used.

Other than on the existing portions of the HCRH, the least impacting location for the trail is next to I-84, where the natural resources have experienced past disturbances and wildlife use is limited by the noise and activity associated with the freeway. Unfortunately having the trail adjacent to I-84 provides a poor quality trail experience because of the traffic and noise. In an effort to restrict impacts on quality habitat, the design team placed most of the trail on the HCRH or along I-84 and utilized disturbed areas to take the trail away from I-84 (Table 1, Figure 2 and Photos 1-5). As a result, over three quarters of the trail is located where impacts could be avoided along the HCRH trail (48%), where the impacts were optimally minimized along I-84 or existing roadway embankment (36%).

Table 1. Route Composition		
Route Location	% of Route	Comment
Existing HCRH (Avoidance)	48	Purpose and Need – Connect the HCRH
Existing Road bed (Minimization)	12	Some impacts due to grade changes or upgrading base to support trail.
Along I-84	24	Least Impact Route
Connecting HCRH and I-84	1	Purpose and Need- Connect the HCRH
Disturbed Areas	10	Following Historic Highway alignment (no longer evident)
Forested Habitat	2	Needed to connect existing HCRH to I-84 and maintain grade requirements.
Tunnel	3	Least Impactful alignment, trail user experience and mimics the original HCRH Alignment.

The project has been designed to avoid impacts to resources wherever practical. Several key avoidance measures taken by the project are outlined below:

Alignment

Wherever practicable, the project has utilized existing maintenance roads, existing HCRH roadway or alignment, or hugs I-84. Nearly 80% of the project alignment follows either existing HCRH alignment or follows I-84. In general, these areas contain lots of pavement, or compacted embankment and do not support habitat for sensitive plants and wildlife. Any vegetation found in these areas are stunted and low quality as compared to areas immediately off the alignment. Examples of where alignment shifted to follow the Historic alignment to minimize impacts include Perham Creek approach and crossing and Mitchell Creek Crossing (Figure 2)



Photo 1. Representative of Road Embankment Stn. 312+00



Photo 3. Representative I-84 alignment. Stn. 383+00



Photo 5. Proposed crossing of Stream B. Existing road/disturbed quarry site. Stn. 468+00



Photo 2. HCRH Crossing at Perham Creek. Note vegetative scar on opposite bank. Using this alignment minimized riparian impacts Stn. 390+00



Photo 4 Existing HCRH Crossing of Mitchell Creek. Note Pavement on either side of the creek. Utilizing the existing crossing minimized riparian impacts. Stn. 419+00

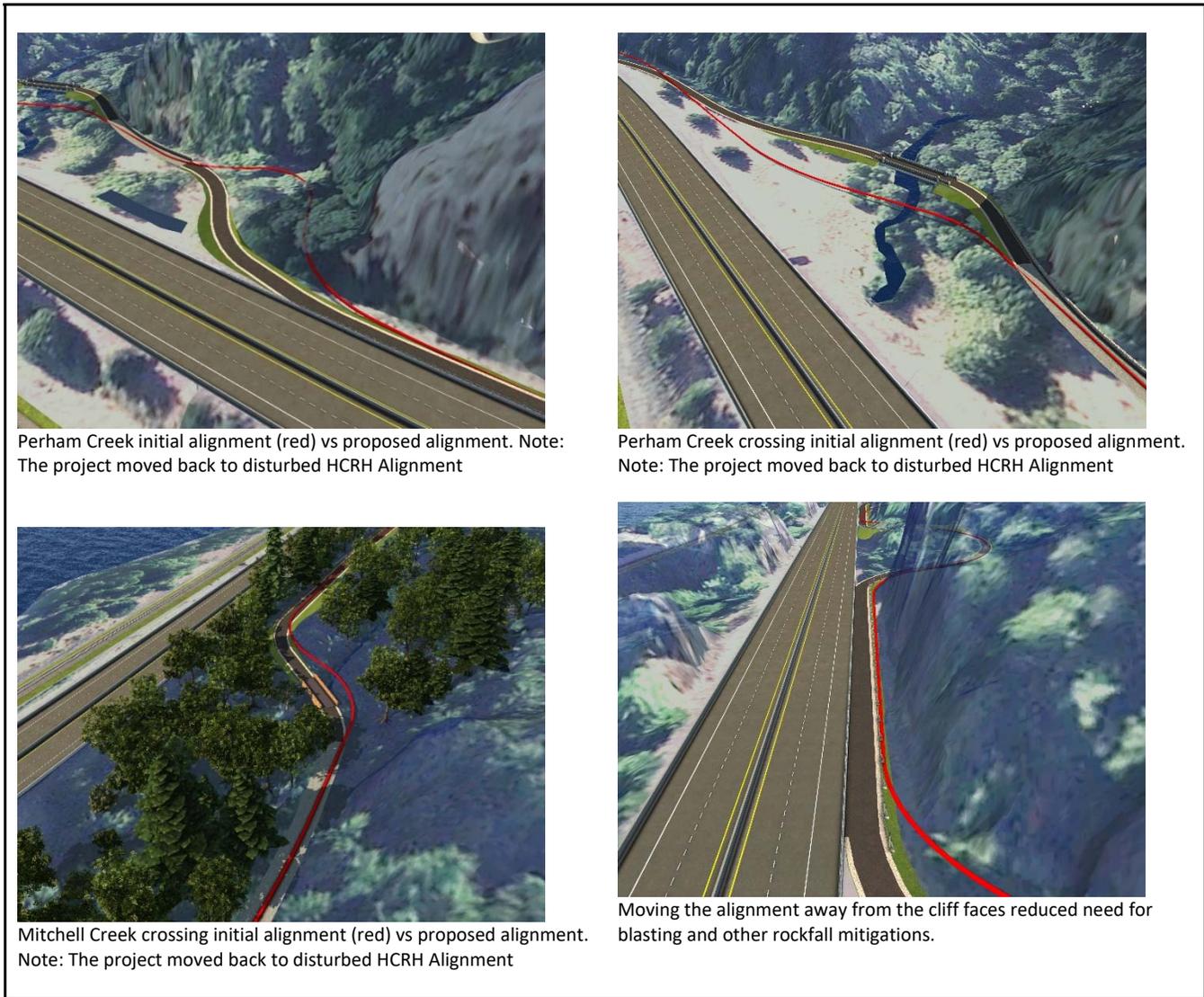


Figure 2. Initial vs. Proposed Alignment Comparisons

Rockfall mitigation

There are many locations in which the proposed trail alignment hugs cliff faces as it travels along I-84. This presented the challenge of protecting the traveling public (both I-84 and trail users) from falling rocks. Initially, the project called for nearly 900,000 cubic yards of blasting and scaling. This would greatly impact cliffs habitat and would have meant the full removal of their communities, including sensitive plants, throughout the project corridor. Additionally, it would have resulted in the removal of large sections of remnant oak communities growing above these basalt features. Impacts to these resources were further avoided by developing alternate rockfall mitigation measures including a combination of raising the trail grade, creating rockfall catchments and installing rockfall fencing between the trail and most trails. These design changes resulted in major reductions in Cliff face impacts and their plant communities throughout the corridor.

Mitchell Point Tunnel

The alignment at Mitchell point was designed to avoid impacts to the cliff and the sensitive douglasia laevigata population that inhabits it. The avoided alignments along I-84 and a viaduct which would have required more extensive rockfall mitigation and scaling of the cliff's face, impacting douglasia and cliff habitats used by plants and nesting birds.

The tunnel entrances (portals) and windows (adits) were also placed in the field to avoid areas inhabited by douglasia individuals.

3. Minimization

The following minimization measures have been implemented into the overall project plan.

- Fine tuning trail location to miss trees and utilize disturbed areas
- Existing HCRH roadbed alignment was utilized whenever possible, even where pavement was no longer existing.
- Clearing will be kept to the minimum area possible
- Blasting and vegetation clearing will occur between September 1 and February 28th, outside of the nesting window for Migratory Birds.
- Installation of storm water treatment for runoff from Mitchell Point State Park Trail head.
- Implementation of erosion control plan for the entire project.
- Removal of noxious weeds in trail and along the corridor
- Installing walls to reduce cut and fill
- Spanning Perham Creek with a clear span bridge and at the original HCRH crossing.
- Spanning bridge at Mitchell creek using the original HCRH crossing
- Massive reduction in blasting
- Massive reduction in cliff scaling, fencing and meshing.

Douglasia Laevigata

The Mitchell Spur cliff faces contain Douglasia laevigata (Stns. 444+00 to 458+00). Along the alignment, the trail, tunnel portals and associated adits have been placed to ensure no individual will be removed for construction. Impacts to this species are associated with equipment scraping during construction of the alignment, blasting of tunnels and adits and installation of rockfall protections. Extensive avoidance and minimization measures have been employed to reduce impacts to this species to the greatest extent practicable. The following BMPs outline how these measures will be carried out during construction.

Rockfall Mitigation Installation

Extensive avoidance and minimization measures will be employed to reduce impacts to this species to the greatest extent practicable. To reduce and avoid impacts during construction, the following BMPs will be instituted:

- The population areas adjacent to the trail alignment will be marked in the field by the Agency Biologist with water soluble, spray chalk paint or other, equivalent nontoxic, water soluble pigment for trail alignment avoidance.
- The population area will be mapped by the Agency Biologist will be clearly shown on the construction drawings as "Natural Resource Area".

- An onsite environmental meeting will occur with the Agency Biologist, Agency Construction, Inspector and Contractor to identify areas of resource concern to walk through the environmental concerns and requirements
- The Contractor will be required to submit an installation plan for Government review and acceptance that describes their installation sequencing, equipment, personnel, general schedule, and inclement weather procedures.
- The Agency Biologist will provide full-time monitoring of installation activities within the natural resource areas to monitor the Contractor's work and ensure the adherence to the installation plan.
- Within the boundaries of the Natural Resource Area, the Contractor will not be allowed to:
 1. Drag equipment or materials across mapped resource areas.
 2. Remove loose rock from the cliff faces.
- There is locational flexibility in the anchorages and posts that comprise the rockfall mitigation system. The positions of the anchorages and posts will be designed to avoid all mapped resource areas. During installation, the anchors will be field-adjusted with input from the Agency Biologist to avoid mapped resource.
- The only element of the rockfall mitigation system that will come into contact with mapped resource areas is the protective rockfall mesh. Installation will be accomplished through low impact methodologies including the following:
 1. Mesh panels will be hoisted by an overhead crane and accurately positioned vertically and horizontally prior to placement on the rock face.
 2. Spotters will be positioned at the work site to communicate locations real-time with the crane operator. Once the design location has been confirmed, the spotter will inform the crane operator who will then gently place the mesh onto the slope to its final position without abrading the rock, on a station-by-station basis, and attaching to previously-installed anchorage points.
 3. Seam locations of mesh panels will be field-adjusted to avoid having to make connections on the mapped resource areas.
 4. Draping over mapped resource areas will not be allowed during excessively windy weather (gusts above 10 miles per hour) that would prevent controlled placement.

Once construction of the trail has been completed, no ongoing impacts to the species anticipated as the trail alignment will follow the existing HCRH roadbed where it is not within a tunnel. Additional buffer impacts will be associated with the redesign of the Mitchell Point trailhead and parking lot.

Blasting and Tunnel Excavation

The following BMP's will be associated with tunnel and adit excavation at Mitchell Point in order to reduce impacts to the sensitive/endemic DoLa. It is anticipated the blasting and excavation techniques mentioned below will be utilized. However, other additional methods using propellants in lieu of explosives (e.g., Magnum-Buster, Royex) have been used successfully to fracture rock in vibration-sensitive areas and for areas where fracturing is to be limited. Such methods may also be considered.

Blasting used for rock excavation will be classified as Controlled Blasting in the construction contract. Special procedures will be taken by the contractor to limit overbreak (excavation beyond the design tunnel/adit geometry), limit ground vibrations and airblast pressures to specified levels, and protect previously installed rock reinforcement and instrumentation. While blasting is certainly a dynamic process, the effects will be controlled substantially with Controlled Blasting as follows:

- Relief holes, in the form of line drilling and/or channel drilling, adjacent to any structure of concern. Such holes are drilled as normal explosive boreholes would be, but closely spaced and not loaded with explosive.
- Explosively loaded holes are loaded with substantially lighter loads in the row or two outside the relief holes. Special explosives are often employed for this use.
- Normal production holes are sequenced with millisecond delays to provide optimum relief during blasting. Current practice for cautious blasting uses electronic rather than pyrotechnic millisecond delay detonators.
- Appropriate monitoring is done to ensure that vibration levels above well-established criteria are not exceeded.

Tunnel excavation will include the following bmps to minimize the risk to surrounding sensitive plants and wildlife during construction:

- Spiling (near horizontal rock reinforcement) will be installed from the rock shelf around the periphery of the tunnel portals to provide localized reinforcement and facilitate a controlled entry geometry.
- Blast mats will be draped over the portal to prevent uncontrolled flyrock.
- Once tunnel excavation “turns under” (enters the rock face), no surface blasting will occur.

Adit excavation will include the following BMPs to minimize the risk to surrounding sensitive plants and wildlife during construction:

- No surface blasting will be required to excavate the viewing adits.
- Viewing adits will be excavated from the running tunnel towards the cliff face.
- The contractor will be required to probe beyond the adit heading with a drill hole to confirm position relative to the outside surface.
- Spiling will be installed from the advancing adit outward towards the cliff face to pre-reinforce the perimeter of the adit at the cliff face and limit overbreak.
- The contractor will be required install additional rock dowel reinforcement within a pre-defined distance of the outside surface (about 10 feet), and to switch to non-explosive blasting techniques.
- Non-explosive blasting techniques such as hoe-rams, hand-mining, and expansive grout will be used mine final 10 foot of adit in a controlled fashion. As such, no flyrock will be generated and no blast-mats will be required.

Additionally, several check-ins will be allowed for the Agency to review and comment on contractor blasting plans and methods. These submittals will already be required, but will be made available to the Agency for review to demonstrate the contractors’ understanding of the blasting work and procedures to meet contract requirements, including:

- General Excavation Plan
- Noise and Vibration Monitoring Plan
- Preliminary Blast Plan
- Personnel Qualifications
- Individual Blast Plan (prior to each blast)
- Blast Report (following each blast)

Larch Mountain Salamander

Removal of piles of scarified HCRH pavement will be monitored by an ODOT Biologist. In the event that a salamander is encountered, it will be salvaged, recorded, and placed in nearby talus habitat.

Hieracium longiberbe

The following minimization measures will be utilized during rockfall mesh installation to avoid impacts to plants above the Stepped Cut:

- There is locational flexibility in the anchorages and posts that comprise the rockfall mitigation system. The positions of the anchorages and posts will be designed to avoid mapped resource areas where possible and to minimize impact where mapped resource areas must be crossed by anchor lines. During installation, the anchors will be field-adjusted with input from the Agency Biologist to avoid sensitive resource impacts.
- Mesh panels will be positioned at the top of the slope and accurately positioned vertically and horizontally before being secured to the top rope.
- During installation, rubbing or dragging of the mesh along the cliff crest will be minimized to the maximum extent practical.
- Draping over mapped resource areas will be completed after HiLo has entered dormancy period (August to February).

4. Impacts

Overview

Biologists conducted numerous field investigations of the Project corridor between 2017 and 2019. After substantial avoidance and minimization, they identified 12.39 acres of direct and indirect (buffer) SNR conflicts within the proposed Project’s API. Of those impacts, 2.05 acres will be direct SNR conflicts and approximately 10.34 acres will be indirect (buffer) conflicts within the proposed Project’s API (Table 6). The majority of direct resource conflicts are a result of unavoidable rockfall mitigation to protect both the trail and I-84. Appendix B provides a detailed breakdown of the Project’s resource feature impacts by trail segment and type. Since the API was conservatively drafted at 5ft beyond actual clearing limits, and API reduction is expected to continue through the design phase of the project these estimates represent the maximum possible Project impacts.

Please See the BRIAR for more detailed analysis of impacts. An overview of the quantity and quality of the habitat impacted is provided here.

Table 2. Total Natural Resources Including Priority Habitat Impacts for Segments E and F		
Segment	Natural Resource Impact Acres	Buffer Impact Acres
E-F	2.05	9.97

Resource	Total Mapped (Acres/ft./Individual)	Natural Resource Impact (Acres)	Buffer Impact Acres
Cliff	2180.08 ft.	0.18	5.53
Oak	26.22 acres	1.86	4.75
Stream		0.01	2.93
Wetland	0.15 acres	0	1.00
Talus	1.64 acres	0	1.54
Snag	14 plants	-	1.20
Plant (HiLo)	19 plants	-	0.35
Plant (DoLa)	193 plants	-	0.45
Peregrine	2 nests	-	0.63
Acreege Totals:		2.05	*18.381

*Buffers overlap so the total buffer area from Table 2 is less than the total of the buffers listed in Table 3. Natural Resource and buffer impacts that overlap were only counted once.

Streams and Wetlands

The project crossed eight streams and only impacted two non-fish bearing streams. Wetland impacts were limited to less than 50 square feet of temporary impacts (Table 4).

Stream 16 and B will be impacted during culvert replacement or installation. The project will impact 3.14 acres of stream buffers.

Wetland 11 will have some temporary impacts to less than 50 square feet of wetland to grade the site for installation of the cross culvert. Wetland 5 and 11 buffers (1.0 acres) will be impacted by the proposed project to construct the trail.

Feature	Impact		
	Cause	Duration	Area
Stream 16	Culvert	Permanent	60 sf
Stream 16	Grading	Temporary	345 sf
Stream B	Culvert	Permanent	45 sf
Streams	Buffer Grading	Temporary	
Streams	Buffer Loss	Permanent	3.49 acre
Wetland	Grading	Temporary	50 sf
Wetlands	Buffer Grading	Temporary	
Wetlands	Buffer Loss	Permanent	1.0 acre

Oak woodlands

The majority of impacts are associated with installation of rockfall mitigation to protect both the trail users and I-84 rockfall events totaling 1.77 acres. An additional 0.15 acres of sliver takes on the habitat edge will occur due to trail alignment construction. The project will directly impact six oak woodland sites and the buffers of one additional site (OW-5) totaling 1.89 acres of direct impacts and 4.75 acres of indirect (buffer) impacts.

Cliffs

As a tradeoff to prevent extensive blasting, the project will elevate the trail at several locations where the project hugs I-84. This will bury approximately 0.18 acres along the base of cliff face. The impacts are minor and will not result in a degradation of the overall habitat. These areas do not provide wildlife habitat due to the proximity to I-84 and at best provide marginal plant habitat due to rock fall and vegetation maintenance within I-84's operational ROW.

Snags

The Project avoids all direct impacts to nurse logs (down dead wood) but will impact 3 snags (standing dead wood). Snags that will be removed are located approximately 50ft from I-84 and are not likely to adversely affect the core habitat or associated sensitive species. Additional snag creation will be proposed as part of the oak woodland mitigation.

Sensitive Plants

Two sensitive plant species (*Hieracium longiberbe* [HiLo] and *Douglasia laevigata* [DoLa]) have been identified within the project corridor. At this time, the Project will impact 3 HiLo individuals, all are located either at the base of cliffs or on the ground within the operational right-of-way of I-84. Impacts are unavoidable to these species as this is the least impactful alignment to other resources and still connecting two isolated segments of HCRH.

One population of DoLa has been located within the project corridor on Mitchell Spur. After extensive avoidance and minimization, the Project will impact approximately 9 individuals. All impacts are associated one section of rock bolting on the western edge of the landforms north face. Additional impacts are possible with the installation of further Rockfall mitigation and tunnel blasting, but it is anticipated that with the successful implementation of avoidance measures no further impacts will be anticipated. All impacts to the cliff face occur within areas previously blasted during the construction of I-84 and later colonized by plants farther up the cliff. The removal of these nine (9) individuals (4%) will not threaten Mitchell Spur DoLa population's survival. It is expected that in time these areas will recolonize from nearby individuals directly above the impacted areas. As such, it is not anticipated that the project will have an adverse effect and further mitigation will not be required.

Buffers

Buffer impacts were calculated for each resource to provide the reviewer with the project's relative impact on an individual resource buffer. Resource buffers often overlapped with the buffers for other resources. Total project buffer impacts ignored buffer overlap to avoid double counting impacts. Total buffer impact was the metric mitigated. To assure appropriate mitigation, buffer mitigation sites were chosen for their ability to buffer many resources.

The proposed trail will impact 9.97 acres of buffer. Most of this buffer is associated with the Viento State Park

Campground and maintenance facility redevelopment. Impacts are occurring within the existing campground, but due to lack of detail at the time of permitting, the buffer impacts were over estimated. Further impacts from the trail were either due to grade changes on top of existing HCRH or within disturbed areas (Perham creek area and Mitchell Point Quarry).

5. Compensatory Mitigation

This plan provides mitigation for natural resources and their buffers that will be impacted by the HRCH Trail. There are direct impacts to streams, oak woodlands, cliffs and a sensitive plant (HiLo). These impacts will be addressed at the impact site or one of the following restoration areas: Mitchell Point East (USFS Parcel), Mitchell Point East Quarry, Roadhouse North and South sites, Mitchell Point Entrance, Sonny Site, Viento Campground site, Chetwoot Trail Oak Site, and the Viento maintenance site (Figure 3). This section discusses the mitigation associated with the direct impacts followed by a descriptions of each mitigation site.



Figure 3. Mitigation Sites Along Alignment

Streams and Wetlands

Impacts to Stream 16 will be mitigated within the riparian zone/buffer of the stream in the Mitchell Point West Mitigation Site. This site is currently overrun with English Ivy. English Ivy has a tendency to grow up and cover trees sapping energy and bringing the tree to an early death. It also prevents saplings from growing with its dense groundcover. These two effects eventually eliminate the stream over story. Removal of the ivy will retain the existing over story, allow a more diverse understory, allow sapling growth, and create a future source of shade and large wood. Mitigation will replace permanent impacts from culvert lengthening with ten times the area of buffer replaced. The stream does not support fish and is down cutting because of its steepness in areas including parts of the impact area.

Stream B will be placed in a culvert under the trail. Currently the stream, which is a short stretch of isolated stream located entirely in a quarry, is crossed as part of the old HCRH used as an access road. Preventing vehicle travel through the stream will mitigate for impacts caused by the culvert. Furthermore, culverting the stream will concentrate flow and may extend the stream further downstream from the trail.

To install the culvert for Stream B, some (less than 50 sf) of temporary impacts will occur to the wetland. The area of grading will be replanted local riparian vegetation.

Stream buffer mitigation is provided at the Perham Creek Mitigation Site, Sonny Mitigation Site (Mitchell Creek), Roadhouse (Stream 16) and Mitchell Point East (Stream B). Wetland Buffer will occur at the Mitchell Point East (Stream B) Site. In these areas, we will remove nonnative invasive plants including English ivy, Himalayan blackberry, and periwinkle. Understory plantings will also occur in some of these areas.

Table 5. Stream and Wetland Mitigation Summary						
Feature	Impact			Mitigation		
	Cause	Duration	Area	Type	Ratio	Area
Stream 16	Culvert	Permanent	60 sf	Buffer restoration	10:1	600 sf
Stream 16	Grading	Temporary	345 sf	Restoration + Buffer Restoration	1:1 + 3:1	1380 sf
Stream B	Culvert	Permanent	45 sf	Extension of existing stream – Move stream out of temporary access roadway.	N/A	N/A
Streams	Buffer Grading	Temporary	-	Restoration + Buffer Restoration	1:1+ 1:0.5	*
Streams	Buffer Loss	Permanent	3.49*	Buffer Restoration	1:1	*
Wetland	Grading	Temporary	50 sf	Wetland Restoration	1:1	50 sf
Wetlands	Buffer Grading	Temporary	-	Restoration + Buffer Restoration	1:1+ 1:0.5	*
Wetlands	Buffer Loss	Permanent	1.02 ac	Buffer Restoration	1:1	*

*Buffers mitigated cumulatively – overlapping resources buffers were combined for a total buffer impact.

Cliffs

The proposed project will bury approximately 0.18 acres along the base of cliff face. The impacts are minor and will not result in a degradation of the overall habitat. These areas do not provide wildlife habitat due to the proximity to I-84 and at best provide marginal plant habitat due to rock fall and vegetation maintenance within I-84’s operational ROW. No mitigation is proposed for this minor impact.

Oregon Oak Woodlands

The trail will impact 1.86 acres of oak woodland. Habitat conversion was avoided and minimized with alternative rockfall mitigation techniques. Most of the habitat is fringe, occurring on the edge of habitat and avoiding large oaks whenever practicable. In addition, 15.64 acres of oak woodland will be restored at 4 mitigation sites, all within the project corridor. This will offset all impacts at an 8:1 ratio, including oak 8.5 acres of oak opening

(removing encroaching conifers) at the Viento Maintenance stand, Stepped cut, and the Chetwoot Trail stand. Additionally 7.1 acres of oak woodland creation will occur at the Stepped cut and Mitchell Point Quarry Restoration site.

Sensitive Plants

Three HiLo plants will be impacted by this project. All individuals are found within the highway row and subject to highway maintenance activities. As such, they will not be salvaged. Instead, after construction the USFS Restoration Services will plant a minimum of 3 plants in the same general locations.

Buffers

The total buffer impact for the Viento State Park to Mitchell Point trail Segments E and F is 10.34 acre. The combined Roadhouse sites provide 6.92 acres of mitigation. Additionally the Sonny site provides another 3.25 acres, Perham Creek Site and Viento Campground provide an additional 1.4 acres of buffer mitigation.

6. Mitigation Sites

Weed Removal Buffer Mitigation Sites

Road House North and South

The Roadhouse site is 6.99 acres and occur within the Project corridor, adjacent to the Mitchell Point trailhead (Segment F Stn. 296+00, Figure 4). This site was originally a homestead, and then a rest stop along the original HCRH. The land was eventually developed into a roadhouse and gas station until donated to Oregon Parks in the 1960s. It is currently a Part of the Vinzenz Lausmann Memorial State Park, which contains Mitchell Spur and associated trails and is managed by OPRD. The only future development proposed within the area is the Project impacts.

Existing onsite vegetation is comprised of douglas fir and bigleaf maple overstory and an understory dominated by English ivy and vinca. Most of the project site contains little to know shrub layer. An unnamed perennial stream runs north to south through the middle of the site and contains very little riparian vegetation. Closer to I-84, the riparian area contains a more natural understory including corylus, toxicodendron, rosa sp (cultivar), alder, and giant horsetail. This location also includes a large amount of cliff buffer.

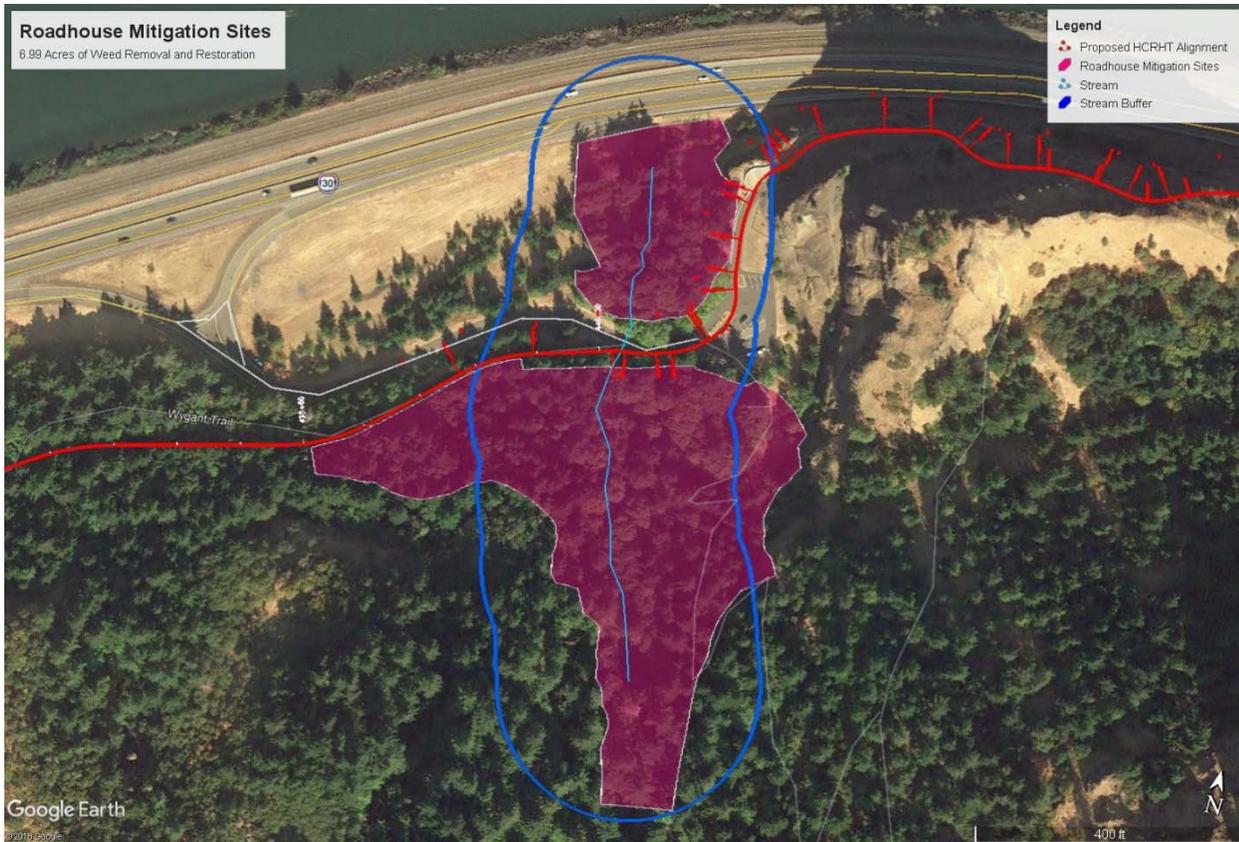


Figure 4. Roadhouse Mitigation Sites

Sonny Site

The Sonny Site is a 3.25 acres site that occurs with then the Project Corridor, west of Mitchell Point (Segment E Stn. 427+00). The location was originally the community of Sonny which grew up around the Sonny Mill and the HCRH. The location was eventually abandoned with the closure of the mill and the HCRH and now is a part of Wygant State Park which is managed by OPRD. The only future development proposed within the area is the Project impacts.

Vegetation at this location contains an intact overstory dominated by Douglas fir and bigleaf maple while the ground is dominated by English Ivy. There is also fairly intact shrub layer composed of snowberry, Oregon grape, and poison oak and sword fern (Figure 3). The eastern border of the site contains riparian buffer associated with Mitchell Creek.

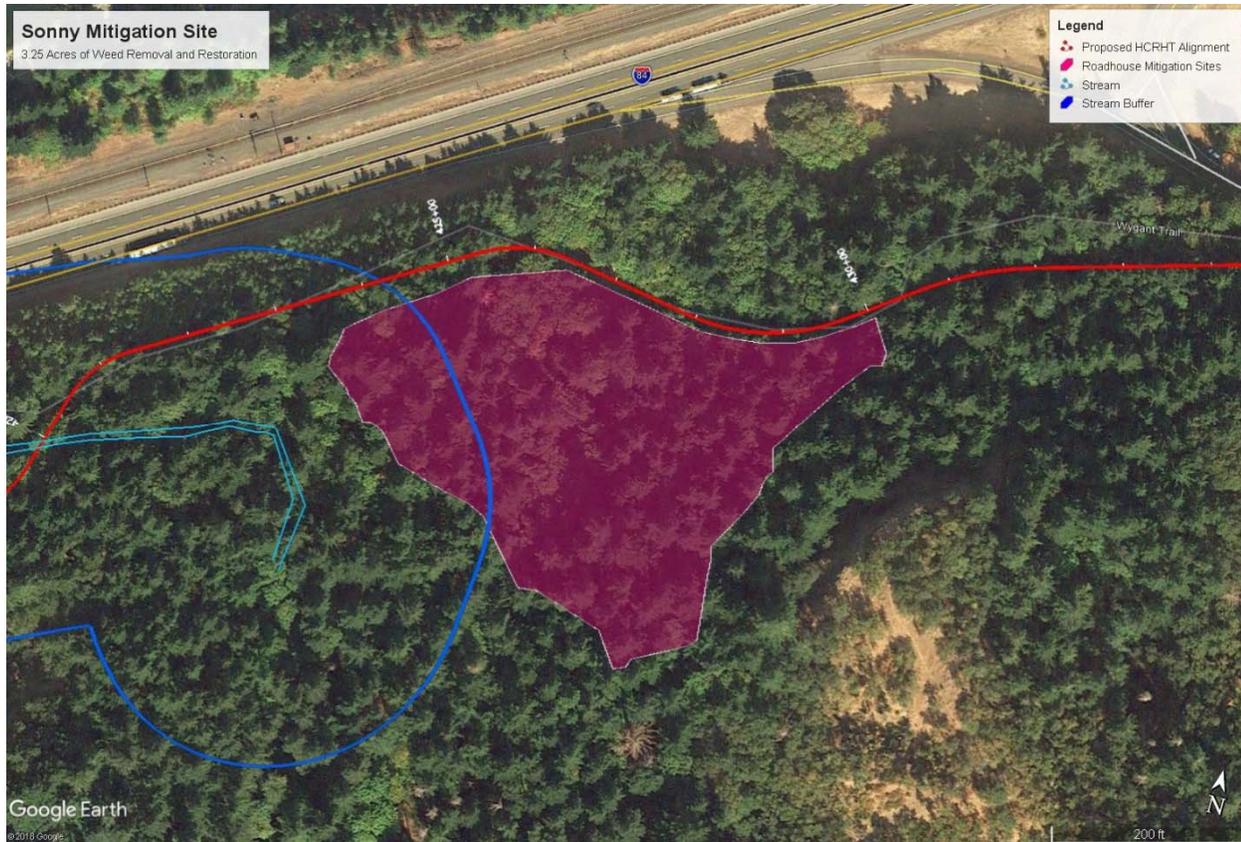


Figure 5. Sonny Mitigation Site

Viento Campground

The Viento Campground Site is a 0.37 acre site that occurs with then the Project Corridor, just east of Viento State Park Campground (Segment E Stn. 315+00). This location was adjacent to the HCRH and eventually became part of Viento State Park, which is managed by OPRD. It appears there is refuse from the camp ground including old fire pits and grates. The only foreseeable disturbance in this area are associated with the proposed Project.

Vegetation at this location contains an intact overstory dominated by douglas fir and bigleaf maple and some Oregon Oak while the ground is dominated by English Ivy, vinca minor and Himalayan blackberry. There is also a sparse shrub layer composed of snowberry, Oregon grape, and sword fern. This location contains rock outcroppings and a dry draw with no apparent hydrologic connection. The eastern half of the site lies within a wetland buffer and the entire site lies within Talus habitat buffer.

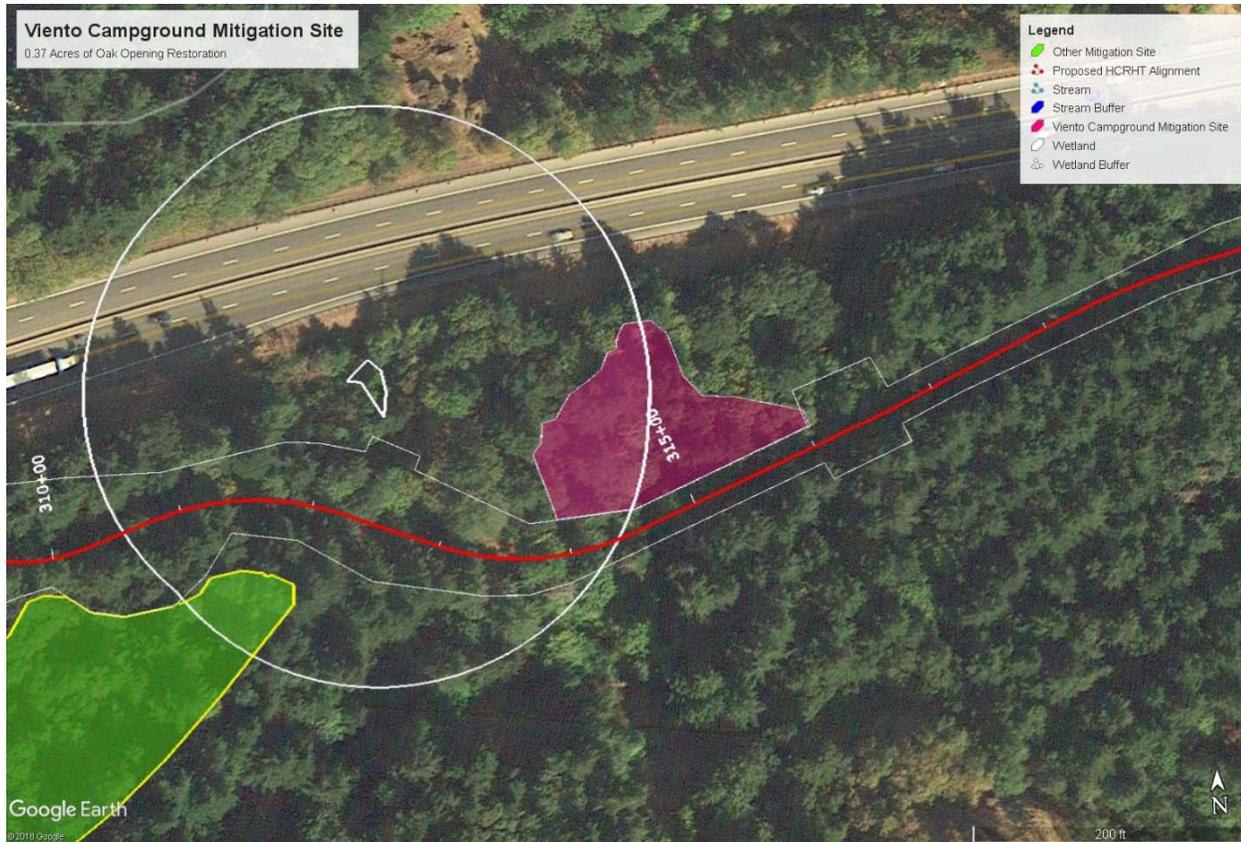


Figure 6. Viento Campground Mitigation Sites

Site Preparation and Approach

The site preparation will include treating the sites for all noxious weeds that appear on the Oregon Department of Agriculture A and B weed lists, and specified non-native plants using mechanical means, hand pulling, and/or approved herbicide applications. The sites will be revegetated as needed to meet the associated success criteria. The goals are to remove all weed species to protect the existing overstory from being choked out while allowing a native understory to recover. At the Roadhouse sites, the development of a diverse riparian community will be an additional goal. Success criteria for these location can be found in Table 6. Due to sensitive of archaeological sites, grading, or earthwork will not occur in these locations.

Vegetation

The full revegetation plan is currently being prepared by the US Forest Service Restoration Services Team (Appendix C) and identifies the plant species selected for potential use at this site. For each site the native vegetation will be retained to the greatest extent practicable. Supplemental planting and revegetation will occur at each site, as needed to meet or exceed the success criteria. Species will match existing native vegetation onsite or representative sample sites and will be locally sourced, genetically appropriate, and adapted to the site conditions. A combination of life forms of high value habitat species, including forbs, grasses, shrubs, and trees, will be utilized to provide the greatest ecological uplift. A sample pallet of what will likely be utilized at the sites can be found in Table 7.

Mitigation Site	Item	Benchmark	Timeframe
Roadhouse North and South, Sonny Site, and Viento Campground	Native plant percent cover	≥ 75% cover	By Year 5
	Native plant diversity	≥ 3 woody species comprise ≥ 5% total cover	By Year 5

Botanical Name	Common Name
Trees	
<i>Acer macrophyllum</i>	Big leaf maple
<i>Pseudotsuga menziesii</i>	Douglas fir
<i>Thuja plicata</i>	Western red cedar
Shrubs Layer	
<i>Acer circinatum</i>	Vine maple
<i>Amelanchier alnifolia</i>	Western serviceberry
<i>Berberis nervosa</i>	Cascade Oregon grape
<i>Rubus spectabilis</i>	Salmonberry
<i>Symphoricarpus albus</i>	Common snowberry
Grass, Ferns and Forbs	
<i>Achlys triphylla</i>	Vanilla leaf
<i>Elymus glaucus ssp. glaucus</i>	Blue wild rye
<i>Heuchera micrantha var. micrantha</i>	Small-flowered alumroot
<i>Polypodium glycyrrhiza</i>	Licorice fern
<i>Polystichum munitum</i>	Sword fern
<i>Tellima grandiflora</i>	Fringe cup

Pollinator Meadows Buffer Mitigation Site:

Dome Rock

The Dome Rock Site is a 0.37 acre site that occurs with then the Project Corridor, east of the Viento State Park Campground (Segment E Stn. 327+00). This location is sandwiched between the proposed HCRHT and I-84. Existing HCRH embankment skirts the southern edge of the site. Historically this would have been part of the HCRH right-of-way. Currently the area is open space within I-84s ROW. This location will be utilized for staging during construction of the Project. After construction no further future impacts are foreseeable for the site.

Vegetation at this location is dominated to grasses and some perennials including pungent lomatium and heart leafed buckwheat with no evident shrub component. In the center of the site, there is a drain that connects to a culvert taking an ephemeral stream south of the HCRH, North across I-84. Additional Buffers that overlap the site are cliff habitat and also sensitive plant buffers.



Figure 7. Dome Rock Mitigation Sites

Site Prep/Approach

The site preparation will include regrading and preparing the soils for revegetation after construction has been completed. The sites will be revegetated as needed to meet the associated success criteria. The goal is to develop a shrub and forb layers that supports diverse wildlife and pollinator habitat. Success criteria for these location can be found in Table 8.

Vegetation

The full revegetation plan is currently being prepared by the US Forest Service Restoration Services Team (Appendix C) and identifies the plant species selected for potential use at this site. For each site the native vegetation will be retained to the greatest extent practicable. Supplemental planting and revegetation will occur at each site, as needed to meet or exceed the success criteria. Species will match existing native vegetation onsite or representative sample sites and will be locally sourced, genetically appropriate, and adapted to the site conditions. A combination of life forms of high value habitat species, including forbs, grasses, shrubs, and tress, will be utilized to provide the greatest ecological uplift. A sample pallet of what will likely be utilized at the sites can be found in Table 9.

Table 8. Pollinator Meadow Success Criteria			
Mitigation Site	Item	Benchmark	Timeframe
Dome Rock	Native pollinator plant diversity	≥ 5 species of pollinator supporting plants	By Year 5

Table 9. Pollinator Planting Pallet	
Botanical Name	Common Name
Shrubs and Ground Cover	
<i>Berberis nervosa</i>	Cascade Oregon grape
<i>Holodiscus discolor</i>	Oceanspray
<i>Rosa gymnocarpa</i>	Baldhip rose
<i>Spiraea betulifolia</i>	Shiny-leaf spiraea
<i>Symphoricarpus albus</i>	Common snowberry
Grasses and Forbs	
<i>Balsamorhiza sagittata</i>	Arrowleaf balsamroot
<i>Bromus vulgaris</i>	Columbia brome
<i>Carex geyeri</i>	Elk sedge
<i>Elymus glaucus</i>	Blue wild rye
<i>Lillium columbianum</i>	Columbia tiger lily
<i>Lomatium dissectum</i>	Fernleaf desert parsley
<i>Lomatium grayi</i>	Pungent desert parsley
<i>Lupinus latifolius</i>	Broadleaf lupine
<i>Phlox diffusa</i>	Spreading phlox

Open Oak/Savannah

Mitchell Point Quarry Site

The Mitchell Point Quarry Site is 5.06 acres and occurs within the Project corridor, adjacent just east of Mitchell Point (Segment F Stn. 119+00). The site was a part of the HCRH scenic right-of-way and then an ODOT quarry for the construction of I-84. It contains a large flat excavated area, three pits (all of which were excluded from the mitigation) and several access roads. The majority of the site is currently owned by ODOT except for an abandoned access road coming from I-84 that is owned by the USFS. This location will be utilized for access and staging of the Mitchell Point Tunnel Construction. After Project construction, no further disturbances are expected to occur.

The site is mainly open space dominated by grasses, chicory, and some scots broom. The sparse overstory is mainly comprised of Douglas fir, Bigleaf maple, Oregon Oak and Ponderosa Pine. Tree density and diversity is higher along the fringes of the site. Generally the project site lacks a defined shrub layer. The subject site also contains a small perennial stream and an associated wetland on the north side. One other wetland is located in the quarry pits (See figure 8).

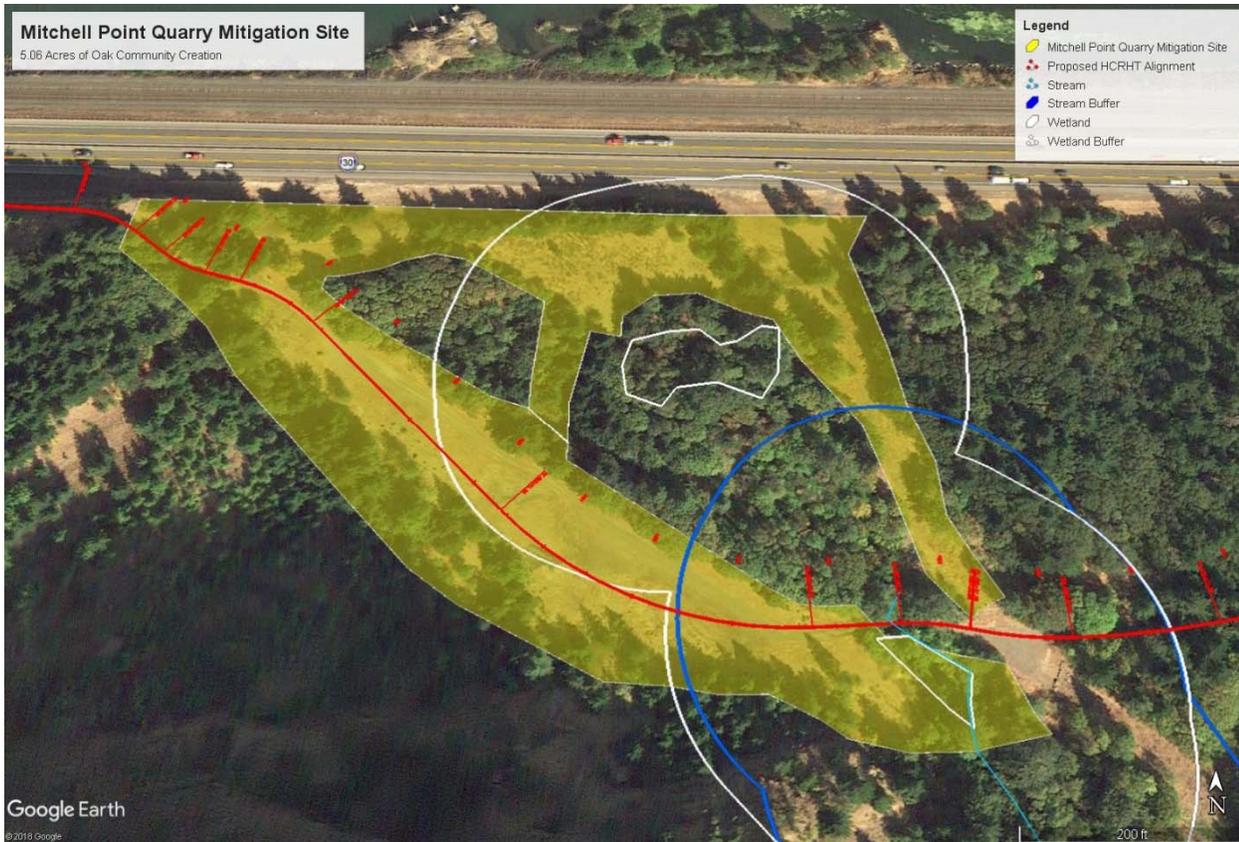


Figure 8. Mitchell Point Quarry Mitigation Sites

Perham Creek

The Perham Creek Site is 1.03 acres and occurs within the Project corridor at Perham Creek (Segment E Stn. 390+00, Figure 9). This site was originally the Wygant State Park road stop along the HCRH, and contained picnic and water facilities. With the construction of I-84, access to the site was cut off. In addition the large open areas were filled with construction materials from the construction of I-84. Additional impacts to the riparian area occurred in 2003 when ODOT replaced the I-84 culvert with a fish passable culvert to the Columbia, however these impacts were mitigated for with lots of riparian plantings. This site is currently owned by ODOT with the land immediately south being a part of Wygant State Park. This location will be utilized for access and staging of the Perham Creek Bridge. After Project construction, no further disturbances are expected to occur.

The portion that will be utilized as a mitigation site is mainly open space dominated by grasses. Several douglas fir exist on the eastern edge of the site. The western portion of the project contains more native species including blue eyed grass some big leafed maple and oceanspray. The subject site also straddles the Perham Creek riparian area which does contain ESA listed salmon and most of the site lies within its buffer. Finally, oak woodland extends on the hills and cliffs on both sites of the mitigation site.

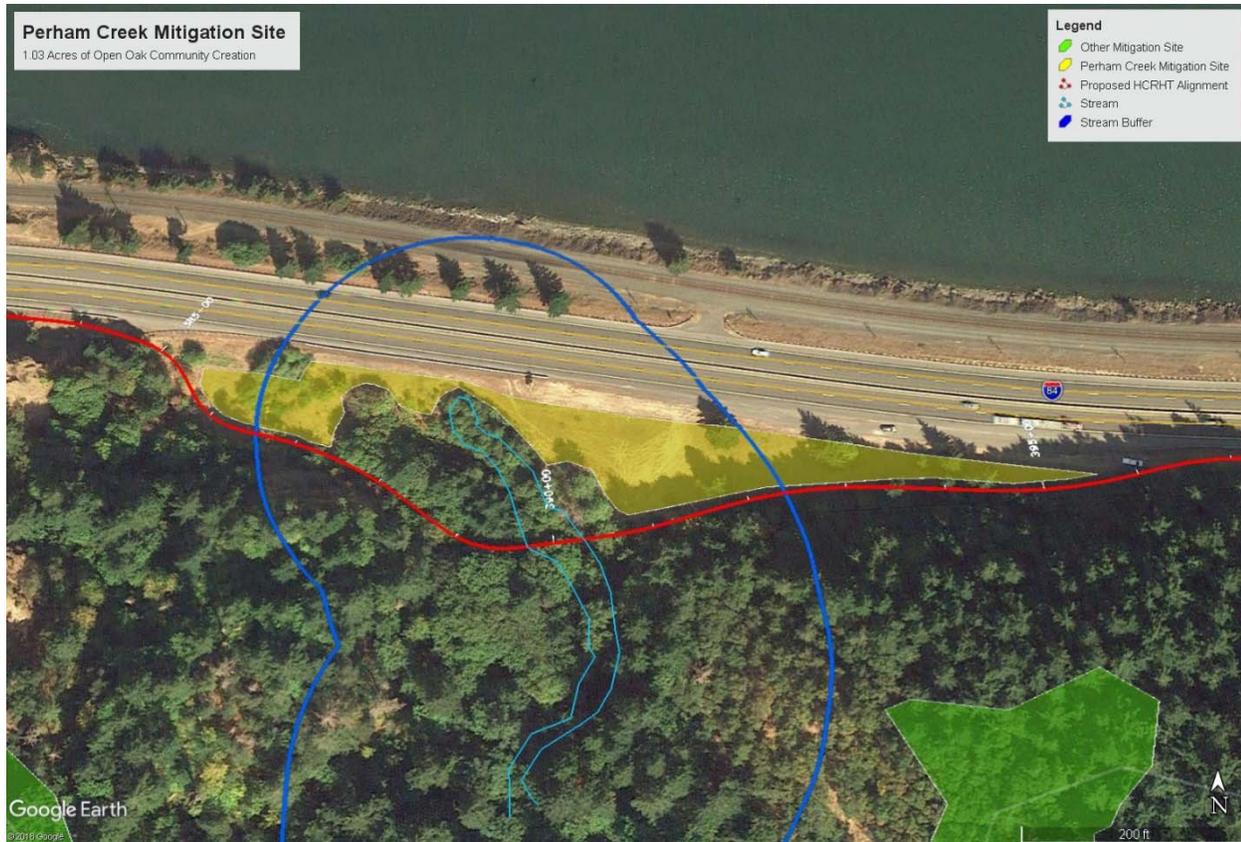


Figure 9. Perham Creek Mitigation Site

Site Prep/Approach

The site preparation will include regrading and preparing the soils for revegetation after construction has been completed. Any Oregon Department of Agriculture A and B listed weeds will be removed from the site using mechanical means, hand pulling, and/or approved herbicide applications. Additionally, tree species will be removed from the site with the exception of Oregon white oak and Ponderosa pine, which will be retained. Top soil will be imported the site regraded to a more natural topography, including deeper locations to support oak plantings. The sites will then be revegetated as needed to meet the associated success criteria. For the Quarry Sites open area and Perham creek, the goals will be to support an open oak savannah community with a pollinator habitat understory. The remaining portion of the Quarry site will be revegetated with an oak woodland community. Success criteria for these location can be found in Table 10.

A small ephemeral seasonally wet meadow will be incorporated into the Mitchell Point Quarry Site to increase habitat diversity. There currently is a depression in the area that retains water. This are will be utilized to plant native seasonally wet meadow species communities.

Vegetation

The full revegetation plan is currently being prepared by the US Forest Service Restoration Services Team and identifies the plant species selected for potential use at this site. For each site the native vegetation will be retained to the greatest extent practicable. Supplemental planting and revegetation will occur at each site, as needed, to meet or exceed the success criteria. Species will match existing native vegetation onsite or representative sample

sites and will be locally sourced, genetically appropriate, and adapted to the site conditions. A combination of life forms of high value habitat species, including forbs, grasses, shrubs, and tress, will be utilized to provide the greatest ecological uplift. A sample pallet of what will likely be utilized at the sites can be found in Table 11.

Mitigation Site	Item	Benchmark	Timeframe
Quarry and Perham Creek	Oregon white oak Savannah/opening density	≥ 4 stems per acre	By Year 5
	Native pollinator plant diversity	≥ 5 species of pollinator supporting plants	By Year 5
	Oregon white oak woodland density (Quarry only)	≥ 50 stems per acre	By Year 5

Botanical Name	Common Name
Trees	
<i>Acer macrophyllum</i>	Big leaf maple
<i>Pinus ponderosa</i>	Ponderosa pine
<i>Quercus garryana</i>	Oregon white oak
Shrubs and Ground Cover	
<i>Berberis nervosa</i>	Cascade Oregon grape
<i>Corlyus cornuta ssp. californica</i>	California hazelnut
<i>Holodiscus discolor</i>	Oceanspray
<i>Rosa gymnocarpa</i>	Baldhip rose
<i>Spiraea betulifolia</i>	Shiny-leaf spiraea
<i>Symphoricarpus albus</i>	Common snowberry
Grasses and Forbs	
<i>Balsamorhiza sagittata</i>	Arrowleaf balsamroot
<i>Bromus vulgaris</i>	Columbia brome
<i>Carex geyeri</i>	Elk sedge
<i>Elymus glaucus</i>	Blue wild rye
<i>Lillium columbianum</i>	Columbia tiger lily
<i>Lomatium dissectum</i>	Fernleaf desert parsley
<i>Lomatium grayi</i>	Pungent desert parsley
<i>Lupinus latifolius</i>	Broadleaf lupine
<i>Phlox diffusa</i>	Spreading phlox

Oregon Oak Opening Sites

Chetwoot Trail Site

The Chetwoot Trail site is 2.39 acres of historic oak woodland located on the landform above Perham Creek (Segment E Stn. 395+00). The oak woodland is in poor condition, having been slowly shaded out by douglas fir. Oak densities become very low as you travel east through the site. The project abuts a 2.3 acre oak woodland that hasn't been encroached on yet directly to the west. The site is currently a part of Wygant State Park and managed by OPRD. Both the Wygant and Chetwoot Trails cross through this site. Historically the site would have likely been a much larger open oak woodland, but lacking fire disturbance has slowly succeeded to the surrounding douglas fir forest. The only foreseeable future impacts to the site would be ongoing maintenance of the trails.

The site is predominantly a closed canopy forest with an overstory of Douglas fir and bigleaf maple, understory trees include Pacific Dogwood and remnant Oregon white oak. A diverse remnant understory also still exists dominated by elk sedge and creeping snowberry and poison oak and to a lesser extent Oregon grape (conifer association). Finally Hieracium longiberbe within the preserved oak woodland approximately 40 feet west of the mitigation site (See figure 10).

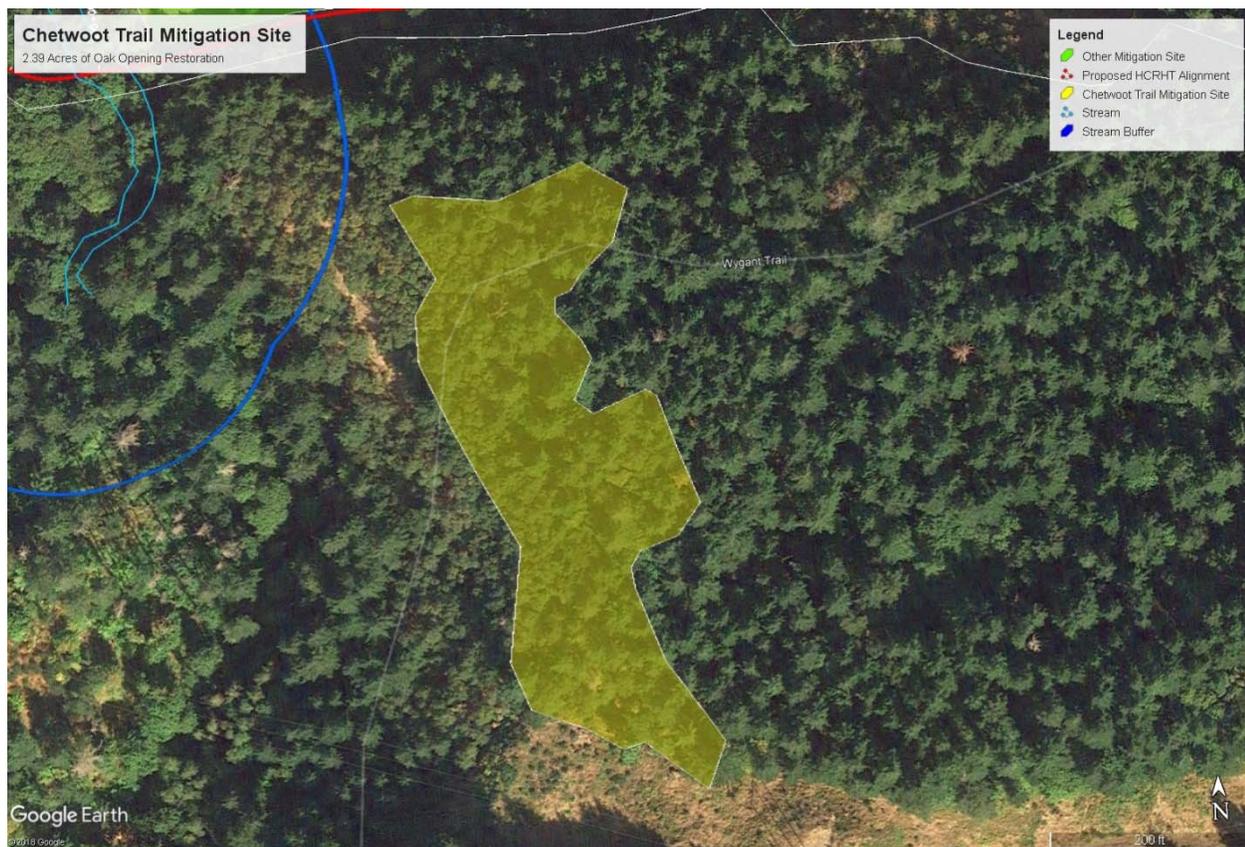


Figure 10. Chetwoot Trail Mitigation Site

Stepped Cut

The Stepped cut site is 6.56 acres of historic oak woodland located above the stepped cut (Segment E Stn. 380+00). The oak woodland is in poor condition, having been slowly shaded out by douglas fir. Oak densities become very low the further north and east you travel. However the site abuts a 3.5 acre oak woodland that has not been encroached upon yet, directly to the North. The site is currently a part of Wygant State Park and managed by OPRD. The Wygant trail crosses through the site. Historically the site would have likely been a very large open oak woodland, but lacking fire disturbance, has slowly succeeded to the surrounding douglas fir forest. The only foreseeable future impacts to the site would be ongoing maintenance of the trails.

The site is predominantly a closed canopy forest with an overstory of Douglas fir and bigleaf maple, understory trees include Pacific Dogwood and remnant Oregon white oak. A diverse remnant understory also still exists dominated by elk sedge and creeping snowberry and poison oak and to a lesser extent Oregon grape (conifer association). Hieracium longiberbe is found along the cliff bluffs approximately 50 feet north of the mitigation site (Figure 11).



Figure 11. Stepped Cut Mitigation Site

Viento Maintenance Facility

The Viento Maintenance site is 1.33 acres of historic oak woodland located adjacent to the Project directly east of the Viento State Park Maintenance building (Segment E Stn. 395+00). The oak woodland is in fair condition, having many douglas firs growing within the woodland, but having not completed shaded the community. The site is currently a part of Viento State Park and managed by OPRD. Historically the site would have likely been a much larger open oak woodland, but lacking fire disturbance has slowly succeeded to the surrounding douglas fir forest. Additionally, the surrounding area was originally the community of Viento and a railroad stop. Later it was added to the Oregon Park system and today is a part of Viento State Park. Once the Project construction is completed, the only foreseeable future impacts to the site would be ongoing maintenance of the trails. This oak woodland will be impacted by project construction.

The site is predominantly a closed canopy forest with an over story of Douglas fir, Oregon white oak and bigleaf maple. A diverse remnant understory also still exists dominated by elk sedge and creeping snowberry and poison oak and to a lesser extent Oregon grape (conifer association, Figure 12).

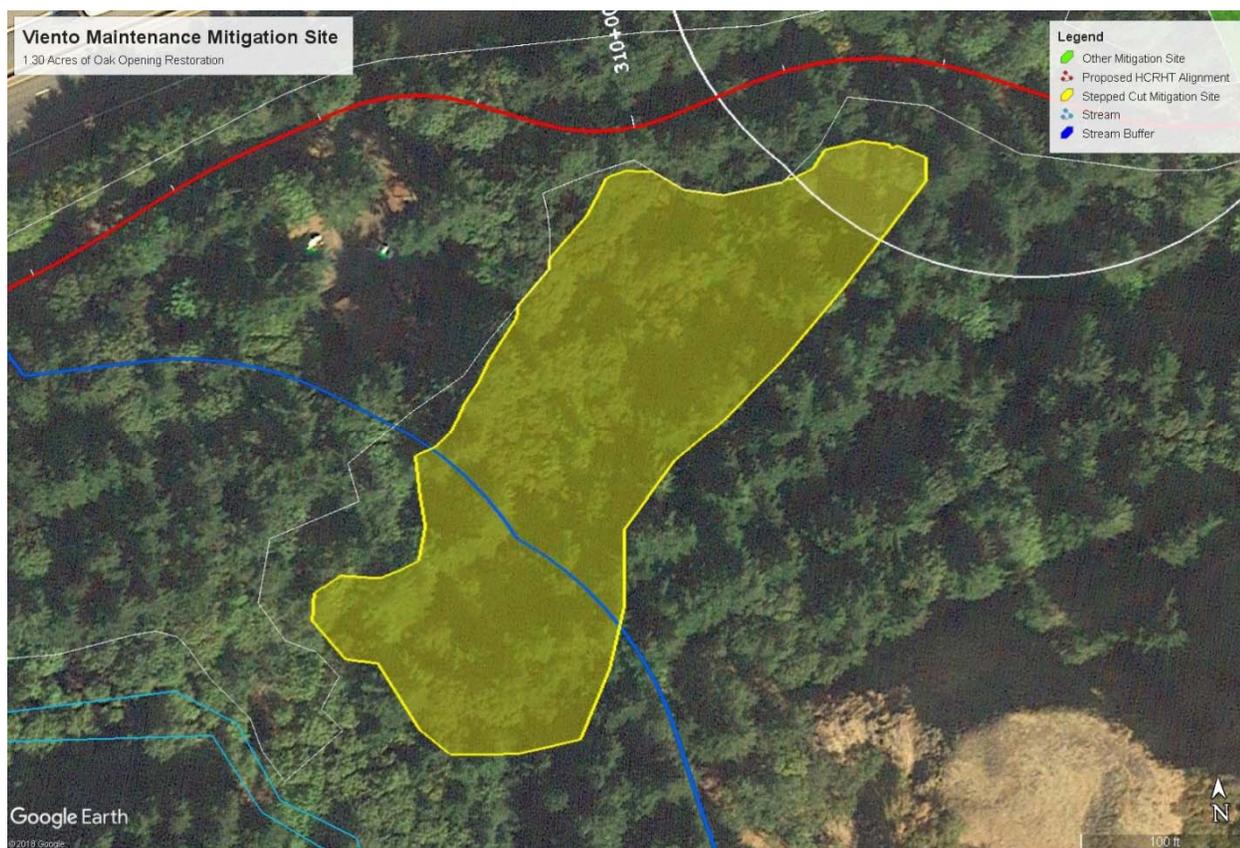


Figure 12. Viento Maintenance Mitigation Sites

Site Prep/Approach

Forest practices for an SMA as outlined in the Columbia River Gorge Management Plan will be followed to remove douglas fir trees from the mitigation site area. All Oregon oak and its associated elk sedge understory will be preserved to the greatest extent practicable. Supplemental plantings will be utilized to encourage oak densification and recover areas fully colonized by douglas fir. The goal will be to reduce the conifer encroachment and restore the oak woodland habitat. Success criteria for these location can be found in Table 12.

Vegetation

The full revegetation plan is currently being prepared by the US Forest Service Restoration Services Team (Appendix C) and identifies the plant species selected for potential use at this site. For each site the native vegetation will be retained to the greatest extent practicable. Supplemental planting and revegetation will occur at each site, as needed, to meet or exceed the success criteria. Species will match existing native vegetation onsite or representative sample sites and will be locally sourced, genetically appropriate, and adapted to the site conditions. In addition to Oregon White Oak, a combination of life forms of high value habitat species, including forbs, grasses, and shrubs, will be utilized to provide the greatest ecological uplift. A sample pallet of what will likely be utilized at the sites can be found in Table 13.

Table 12. Oak Woodland Success Criteria			
Mitigation Site	Item	Benchmark	Timeframe
Chetwoot, Bench Cut, and Viento Maintenance	Oregon white oak density	≥ 50 stems per acre	By Year 5

Table 13. Oak Woodland Planting Pallet	
Botanical Name	Common Name
Trees	
<i>Acer macrophyllum</i>	Big leaf maple
<i>Arbutus menziesii</i>	Pacific madrone
<i>Pinus ponderosa</i>	Ponderosa pine
<i>Quercus garryana</i>	Oregon white oak
Shrubs and Ground Cover	
<i>Berberis nervosa</i>	Cascade Oregon grape
<i>Corlyus cornuta ssp. californica</i>	California hazelnut
<i>Holodiscus discolor</i>	Oceanspray
<i>Rosa gymnocarpa</i>	Baldhip rose
<i>Spiraea betulifolia</i>	Shiny-leaf spiraea
<i>Symphoricarpus albus</i>	Common snowberry
Grasses and Forbs	
<i>Balsamorhiza sagittata</i>	Arrowleaf balsamroot
<i>Bromus vulgaris</i>	Columbia brome
<i>Carex geyeri</i>	Elk sedge
<i>Elymus glaucus</i>	Blue wild rye
<i>Lomatium dissectum</i>	Fernleaf desert parsley
<i>Lupinus latifolius</i>	Broadleaf lupine

Accounting

Table 14 lists the restoration sites and the area provided. It also lists the total impacts mitigated for the HCRHT - Segments E&F by the 10 sites. ODOT is providing nearly 10.91 acres of Habitat mitigation and more than 16.67 acres of oak habitat mitigation. There are more than 0.57 acres of additional habitat restoration and 1.76 acres of oak restoration beyond what is needed to address project impacts. ODOT will propose use this as mitigation for the final trail segments G&H.

Table 14. Mitigation Accounting			
Buffer Mitigation Credits	Acres	Oak Mitigation Credits	Acres
Roadhouse North	1.77	Mitchell Point Quarry	5.06
Roadhouse South	5.22	Chetwoot Trail Site	2.39
Sonny Site	3.25	Perham Creek	1.03
Dome Rock	0.37	Stepped Cut	6.56
Viento Campground	0.37	Viento Maintenance	1.33
Total Buffer Mitigation	10.98	Total Oak Mitigation	16.67
Buffer Mitigation/Debits		Oak Habitat Impacts	8:1
Segment E Buffer	8.62	Oak impacts Segment E	14.44
Segment F Buffer	1.72	Oak Impacts Segment F	0.46
Stream Direct Impact	0.01		
Total Buffer Impacts	10.35	Total Oak Impacts	14.90
Excess Buffer Mitigation	0.63	Excess Oak Mitigation	1.76

Monitoring

The USFS Restoration Team through an agreement with Western Federal Lands will quantitatively monitor the restoration site on years 1, 3 and 5 after installation. If all the performance standards are achieved in less, ODOT may terminate monitoring with approval of the review agencies after year 3. Qualitative assessments of the will occur on years 2 and 4. Restoration site maintenance may be necessary and could occur each year.

7. References

Columbia River Gorge Commission (CRGC), and USDA Forest Service. 2016. *Management Plan for the Columbia River Gorge National Scenic Area*. CGRC, White Salmon, WA, and USFS, Hood River, OR.
URL: <http://www.gorgecommission.org/managementplan.cfm>.

REFERENCES