3.0 AFFECTED ENVIRONMENT, SIGNIFICANT IMPACTS, MITIGATION MEASURES, AND SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

This chapter of the SEIS contains supplemental information concerning the revised Desert Claim proposal. It evaluates significant impacts and recommends mitigation measures, where appropriate, related to wetlands and streams, wildlife and habitat, cultural resources, and visual resources for the revised proposal. This information supplements the analysis contained in the Desert Claim Final EIS (2004) and focuses on changes to the proposal, including the revised site area and turbine layout. The former analysis is not repeated in this document; however, for the convenience of the reader, the major conclusions of the Final EIS are summarized at the beginning of each sub-section.

The impact analysis addresses the following types of impacts: direct (construction and operational), indirect, and cumulative. For the purposes of this analysis, cumulative impacts are defined to encompass those generated by the Project in combination with other approved wind power projects in the general area, including the Wild Horse, Kittitas Valley, and the Vantage Wind Power projects. Information on those proposals was obtained from the following published environmental documents: Kittitas Valley Final EIS, Wild Horse EIS, and the Vantage Wind Power Project SEPA Checklist and Determination of Non-Significance.

3.1 WATER RESOURCES: STREAMS

3.1.1 Summary of Prior Environmental Analysis

The Desert Claim Final EIS identified potential impacts to streams from the original project proposal, which could possibly be mitigated through micro-siting, use of Best Management Practices, and restoration. Impacts included temporary impacts to disturbance along 3,700 lineal feet of streams and 3 acres of riparian area; and permanent impacts from Project facilities estimated at 1,200 lineal feet of streams and less than 1 acre of riparian area.

3.1.2 Affected Environment

The proposed Project is located within the central portion of the Upper Yakima River drainage basin. The Yakima River begins on the eastern slope of the Cascade Mountains at Keechelus Lake in the Upper Kittitas Valley and flows southeasterly through the lower plateau and river-bottom lands to the Columbia River, draining an area of approximately 6,155 square miles.

Streams located within the Project Area drain into the Yakima River, upstream of Ellensburg and approximately 40 miles downstream of the river's headwaters. Because the Yakima River Basin

receives little direct precipitation (8.9 inches per year), these streams are primarily fed by the snowmelt of the ridges to the north of the Project Area (WRCC 2007).

Twenty-one streams were identified, evaluated, and delineated within the Project site. The definitions and standards in Kittitas County's Critical Area regulations was used to classify streams (KCC 17A.07). For more detailed information regarding the stream inventory, refer to the Desert Claim Wind Power Final EIS (Appendix B, Stream and Wetland Delineation Report).

Of the streams identified, seven were classified as Type 3, which are defined as segments of natural waters that are not classified as Type 1 or 2, and have a moderate to slight fish, wildlife, or human use. The remaining 14 streams were classified as Type 4, which are defined as segments of natural waters that are not classified as Type 1, 2, or 3 waters, and have a channel width of 2 feet or more between the ordinary high water marks); or Type 5, that are segments of natural water which are not classified as Type 1, 2, 3, or 4 waters, and have a channel width of two feet between the ordinary high water marks, including streams with or without well-defined channels. Type 4 and 5 streams are intermittent in nature and may be dry beds at any time of the year. Kittitas County's regulations require a 50-foot buffer for Type III streams and 15-foot buffer for Type 4 and 5 streams. The ordinance does not classify irrigation ditches, waste ways, drains, outfalls, operational spillways, channels, stormwater runoff facilities or other wholly artificial watercourses as streams (Kittitas County 2007).

3.1.3 Significant Impacts

3.1.3.1 Desert Claim Revised Proposal

Potential impacts to streams and buffers from construction activities include disturbance of the streambed and banks, disturbance or removal of riparian vegetation, potential filling or relocation of parts of streams, and erosion and sedimentation, which could degrade water quality.

Project access roads or the power collection system would cross six Type 3 streams or irrigation ditches. All road crossings are proposed to bridge the affected streams to avoid impacts. In locations where the power collection system intersects these water bodies, crossings would occur by boring underneath, bridging, or using aboveground power poles. No temporary or permanent impacts are anticipated to occur.

Potential indirect impacts would be the same as identified in the Desert Claim Final EIS.

No Action

As described in the Desert Claim Final EIS, under the No Action alternative, the proposed wind power facility would not be constructed and no project-related impacts to streams would occur. However, past and current impacts to streams—such as can occur in conjunction with rural

residential development or ongoing agricultural activities—would continue for the foreseeable future. Conversion of land for low density rural residential uses could occur over the long term and result in direct and indirect impacts to streams. Such effects cannot be quantified.

3.1.4 Cumulative Impacts

As identified above, no temporary or permanent impacts to streams are expected to occur as a result of the revised Desert Claim proposal. Similarly, based on review of applicable environmental documents, no impacts are identified for the Kittitas Valley or Wild Horse projects. The Vantage Wind Power Project could entail a small but unquantified amount of fill placed in one seasonal drainage. Each project would implement mitigation measures in the form of construction Best Management Practices to minimize sedimentation and potential water quality impacts. Cumulative impacts are not expected to be significant.

3.1.5 Mitigation Measures

Mitigation measures, such as bridging or boring, have been incorporated into the proposal so that no significant impacts to streams would occur. As identified in the Desert Claim Final EIS and Section 2.2.3.4 previously, these include developing and implementing construction BMPs prescribed in an SWPPP required as a condition of the construction stormwater permit. The measures identified in the SWPPP would minimize erosion, sedimentation, and impacts to water quality. No additional mitigation measures are required.

3.1.6 Significant Unavoidable Adverse Impacts

Potential temporary and permanent impacts to streams would be avoided. Therefore, no significant unavoidable adverse impacts to streams would occur as a result of the proposal.

3.2 PLANTS AND ANIMALS

3.2.1 Vegetation

3.2.1.1 Summary of Prior Environmental Information

The Desert Claim Final EIS documented an inventory of vegetation types within the Project Area for the original proposal and an analysis of the impacts of project development on those resources. The analysis indicated that construction would temporarily disturb 322.4 acres of land in various habitat types (not including approximately 20 acres within construction staging and storage areas that had not yet been located), while permanent facilities would displace 87.9 acres. Project facilities would primarily be located in grassland and shrub steppe habitat types. Based on the specified significance criteria applied in the analysis, the temporary and permanent impacts to vegetation were not considered to be significant. The Final EIS described a variety of

mitigation measures intended to minimize vegetation impacts, restore disturbed areas, and replace lost habitat.

3.2.1.2 Affected Environment

Vegetation in the original Project Area was mapped according to vegetation types characterized by the dominant plants (Young et al. 2003a). This mapping was updated in fall 2006 and again in fall 2008 based on the revised Project Area, the results of vegetation mapping in the surrounding areas, aerial photography and a ground survey. The revised Project Area includes parcels totaling 5,200 acres, including a combination of private property and land leased from WDNR. Based on the new Project Area and updated vegetation mapping, habitat acreages in the Project Area were revised (**Table 3.2-1**).

Vegetation in the Project Area was classified into ten types (**Table 3.2-1**, **Figure 3.2-1**). The primary vegetation type is grassland, covering over half of the Project Area (57.3 percent), primarily in the western and central parcels. Shrub-steppe is the second most common vegetation type (32.7 percent of the Project Area), followed by agricultural areas (4.7 percent). For the purposes of the vegetation map, the agricultural areas consisted of those areas where the vegetation is actively managed (e.g., irrigated and/or mowed) for agricultural purposes; however, the shrub-steppe and grassland types are also used for agriculture (i.e., cattle grazing). Other vegetation types mapped in the Project Area include grassland/lithosol (0.6 percent), riparian shrub (2.1 percent), wet meadow (1.7 percent), riparian forest (0.6 percent), open water (0.2 percent), and developed (0.1 percent).

The Project Area has been decreased by approximately 37 acres from the previous project area identified in the 2004 Final EIS. The descriptions of the different types of vegetation found in the EIS have not changed, but pine forest does not occur in the new Project Area.

According to U.S. Fish and Wildlife Service information, a federally listed species of orchid—Ute-ladies tresses—could occur in habitat found in Kittitas County. Consultation with the DNR regarding Heritage Program data indicates that Ute-ladies tresses has been documented in Chelan and Okanogan Counties, but not in Kittitas County.

A formal survey for federally-listed rare plants was conducted for the entire Project Area on July 28 through 30, 2009, during the growing season for Ute-ladies tresses; the survey report is included in Appendix B of the Final SEIS. The survey did not identify the presence of any Ute-ladies tresses.

Washington Natural Heritage Program data for Kittitas County was also reviewed for the potential occurrence of state-listed threatened or endangered plants on the site. Of the plants identified as potentially occurring within Kittitas County, none were identified as likely to be

present on the site because the habitat requirements of listed species are not present, and because a high degree of site disturbance has occurred from ongoing activities.

Table 3.2-1. Vegetation Types in the Project Area

Vegetation Type	Approx. Acres[1]	Percent of Project Area	General Habitat Description
Agricultural	245.4	4.7	Agricultural areas are sites used for irrigated hay meadows that are periodically mowed.
Developed	5.9	0.1	Areas where human activity has removed or altered natural vegetation, such as residential homes and farm buildings and yards.
Grassland	2,981.9	57.3	Areas dominated by grass species, primarily bunchgrasses bluebunch wheatgrass, Sandberg's bluegrass, cheatgrass, and bulbous bluegrass.
Grassland/ Lithosol	30.7	0.6	A subset of the grassland habitat type found on exposed ridges in shallow soils (lithosol) in the northern-most parcel. Sparse grasses (Sandberg's bluegrass) dominate, along with scattered forbs and occasional shrubs.
Open Water	7.9	0.2	Areas of open water including natural ponds, stock ponds, and the irrigation canal.
Riparian	30.7	0.6	Riparian zones dominated by trees and tall shrubs, located in drainages with perennial or intermittent streams. The dominant species include cottonwoods and various willows. In some locations, the shrub understory is very dense, limiting herbaceous growth.
Riparian	109.8	2.1	Riparian areas adjacent to streams or irrigation ditches where shrubs are common, but often scattered. Common shrub species include black hawthorn and coyote willow. Various herbaceous species are present in the understory. Weedy species, including and knapweed were often observed.
Shrub Steppe	1,701.7	32.7	Upland areas dominated by shrubs, primarily bitterbrush and rigid sagebrush, with an understory of mixed grasses and forbs. Four acres of hawthorne are also included in this category but are not impacted by planned facilities. A few weedy species, such as cheatgrass and knapweed, were observed, but weedy species in general were not found over large extents of the area.
Wet Meadow	86.1	1.7	Areas dominated by hydrophytic vegetation, including various sedges, grasses, and rushes and other herbaceous species. These areas appear to be saturated or inundated most of the year, either from leakage from the irrigation canal or stockponds, or due to high groundwater in low spots and swales. Weeds were observed in some of the wet meadows, primarily chicory.
Total	5,200	100	

[1] Approximate acreage totals based on GIS mapping and calculations.

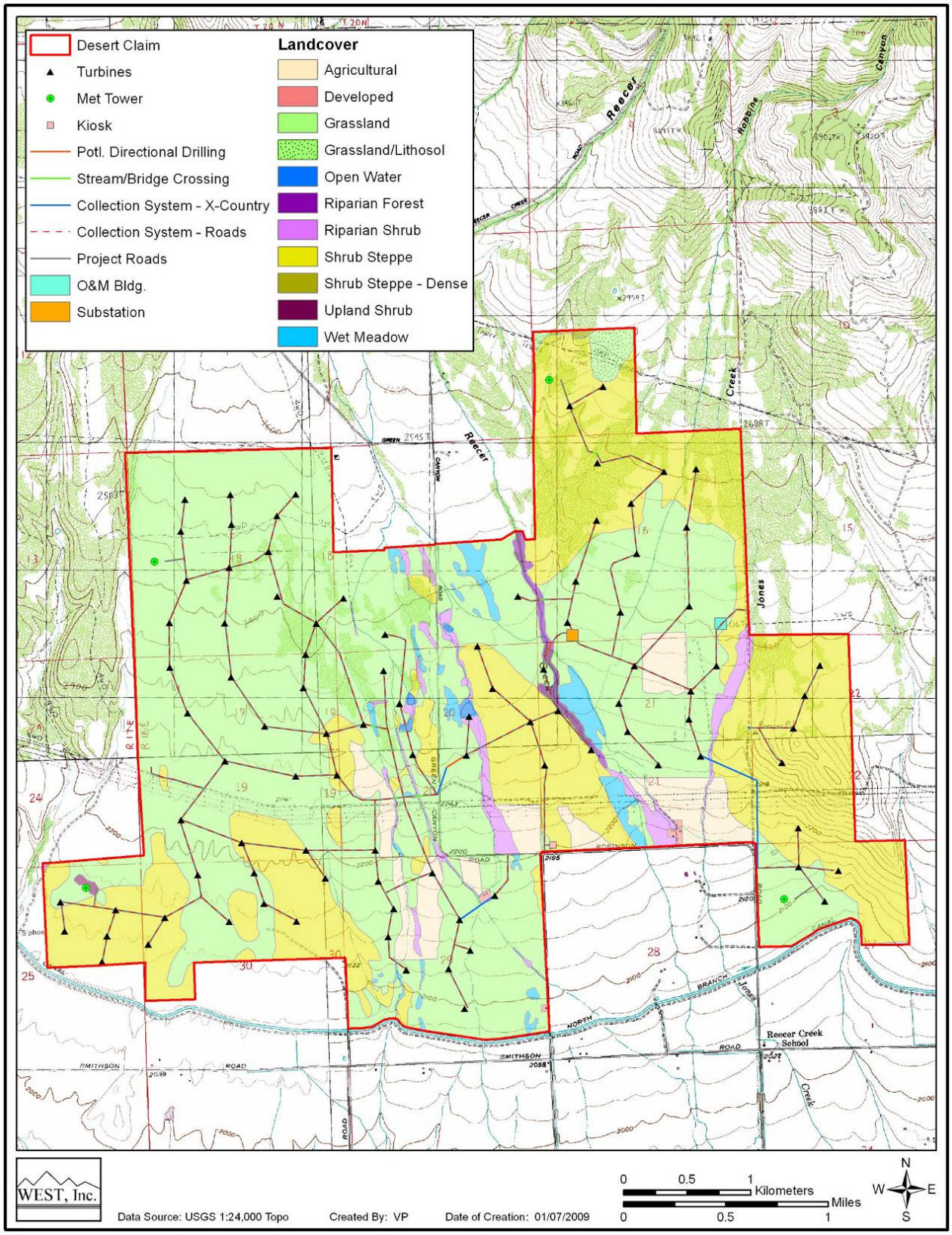


Figure 3.2-1. Vegetation Mapping of the Revised Desert Claim Wind Power Project

3.2.1.3 Significant Impacts

Desert Claim Revised Proposal

The potential habitat impacts were first identified using GIS analysis based on the proposed Project layout provided by the Applicant. These potential impacts are summarized in this section and shown in Table 3.2-2. Based on this analysis, the Applicant then made small modifications in the layout to avoid any wetlands or streams within the Project area. For purposes of the Habitat Mitigation Plan, actual habitat impacts will be determined based on the final project design.

Based on the initial GIS analysis of the Project layout before mitigation, an estimated 86.4 acres of vegetation in the Project Area would be permanently occupied by Project facilities and an additional 230.8 acres would be temporarily disturbed (**Table 3.2-2**; total disturbance is calculated at 317.2 acres). These calculations do not account for Project facilities that have not yet been sited, including construction staging and storage areas; these would likely add approximately 19.5 acres of temporarily disturbed area to the Project total. The access roads account for most of the permanent impacts to vegetation, accounting for 71.5 acres of the permanent habitat loss.

The total acreage of permanent impact for the new proposed layout before mitigation is slightly less (by 1.5 acres) than had been calculated for the original Desert Claim layout (see Table 3.4-2, page 3-65 of the 2004 Final EIS). The acreage of temporary disturbance for the new proposed layout is approximately 5 acres less than had been calculated for the original proposal.

Most Project facilities would be located in grassland and shrub-steppe habitat types. An estimated 23.04 acres of shrub-steppe would be occupied by Project facilities and permanently displaced. An estimated 58.12 acres of grassland (including the grassland/lithosol type) would be permanently displaced. In addition, an estimated 2.19 acres of agricultural lands would be permanently displaced, as well as 0.71 acre of riparian forest and 0.30 acre of riparian shrub. Desert Claim has committed to use micro-siting of facilities to avoid impacts to wetlands and streams; as a result, the potential impacts to open water and wet meadow impacts shown on **Table 3.2-1** would not occur.

As noted above, a formal survey for Ute-ladies tresses was conducted in July 2009, and this federally-listed rare plant was not observed on the Project site. Therefore, no impacts to Ute-ladies tresses would occur. State-listed rare plants are not expected to be present on the site because relevant habitat characteristics are not present and the Project Area has been disturbed by ongoing agricultural activities.

Table 3.2-2. Approximate Acres of Impact by Facility and Habitat Type (before mitigation)

Facility	Vegetation Type	Approximate Acres of Impact	
		Temporary	**Permanent**
Turbines[1]	Agricultural	1.12	0.11
	Developed	<0.01	0.00
	Grassland	64.29	6.82
	Grassland/Lithosol	<0.01	0.00
	Open Water	0.59	0.09
	Riparian Forest	0.84	0.03
	Riparian Shrub	0.45	0.02
	Shrub Steppe	31.29	3.42
	TOTAL	*98.60*	*10.50*
Access Roads[2]	Agricultural	5.59	2.13
	Grassland	127.03	48.31
	Open Water	0.35	0.13
	Riparian Forest	1.91	0.70
	Riparian Shrub	0.77	0.28
	Shrub Steppe	52.07	19.77
	Wet Meadow	0.48	0.18
	TOTAL	*188.20*	71.50
Collection System	Agricultural	0.09	0.00
Buried Along Project Roads[3]	Grassland	2.10	<0.01
	Open Water	<0.01	0.00
	Riparian Forest	0.03	0.00
	Riparian Shrub	0.01	0.00
	Shrub Steppe	0.86	<0.01
	Wet Meadow	<0.01	0.00
	TOTAL	*3.11*	*<0.10*
Buried Cross-Country	Developed	0.02	0.00
	Grassland	0.35	<0.01
	Riparian Shrub	0.01	0.00
	Shrub Steppe	0.31	<0.01
	TOTAL	*0.69*	*<0.10*
Met Towers	Grassland	*0.30*	*0.07*
	Shrub Steppe	*0.10*	*0.03*
	TOTAL	*0.40*	*0.10*
Construction Staging/Storage		(19.5)	-
Substation	Grassland	2.80	2.00
O&M Facility	Grassland	2.72	1.94
	Shrub Steppe	0.08	0.06
	TOTAL	*2.80*	*2.00*
Kiosk	Grassland	0.19	0.00
	Shrub Steppe	0.81	0.30
	TOTAL	*1.00*	*0.30*
Total		**317.20**	**86.40**

[1] Assumes construction disturbance for each turbine pad and transformer will temporarily affect a 120-foot radius around the tower (~1 acre); area of permanent impact based on a 39-foot radius tower pad (0.11 acre).

[2] Assumes a 50-foot wide temporary disturbance corridor and a 20-foot wide permanent disturbance corridor. A 115% factor applied to account for increase curves and intersections which are larger than the standard road.

[3] For buried collection system an 5-foot wide temporary disturbance corridor was used with residual permanent impacts diminishing over time through reclamation and an 85% reduction factor applied for temporary disturbance that would occur along roads and within road disturbance.

No Action

Under the No Action alternative the existing vegetation conditions within the Project Area would remain generally as they are, subject to ongoing agricultural operations and rural residential development. No impacts to existing vegetation communities would occur as a result of wind energy development.

3.2.1.4 Mitigation Measures

Measures to mitigate impacts to vegetation described in the Desert Claim Final EIS are still applicable to the revised Project. Generally, these include use of the following:

- All Project facilities (turbines, roads, electrical system components) will be micro-sited to avoid any impacts to wetlands.
- Best management practices will be implemented during construction to minimize the disturbance footprint. These include, but are not limited to, the following:
  - installing temporary sediment controls on roads used for construction access prior to construction;
  - using silt fencing and straw bale sediment barriers around temporary workspaces and construction rights-of-way;
  - maintaining temporary sediment control structures until construction area vegetation re-establishes; and
  - clearing vegetation only to the extent necessary.
- Plans and standards for site reclamation and restoration will be developed and submitted to EFSEC for approval.
- Measures to control noxious weeds will be implemented, including but not limited to, the following:
  - developing a noxious weed control plan prior to construction and implementing it over the life of the Project;
  - washing down construction and maintenance vehicles entering and exiting the site to avoid transport of noxious weeds;
  - using certified "weed free" straw bales; and
  - re-vegetating temporarily disturbed areas quickly with native vegetation.
- The Applicant will provide compensatory mitigation, by acquiring a mitigation parcel or make a payment in lieu of mitigation, pursuant to the WDFW Wind Guidelines.

Subsequent to the Draft SEIS, the Applicant agreed to a list of specific mitigation measures as documented in the Stipulation with the CFE and the Agreement with WDFW. With respect to mitigation of vegetation impacts, these documents address the development and implementation of a Habitat Mitigation Plan, preparation of a Construction Soil Management and Vegetation Plan and a Noxious Weed Control Plan, use of project design and construction procedures to avoid or minimize habitat impacts, and assignment of an Independent Environmental Monitor

during construction. Please refer to Section 2.1.4 for identification of the specific measures included in these agreements.

3.2.1.5 Cumulative Impacts

Development of the Desert Claim project would result in both temporary and permanent loss of vegetation within the Project Area, with corresponding impacts to several types of plant communities present. These impacts would be mitigated in accordance with WDFW guidelines as described above. These impacts would occur within the context of disturbance and vegetation change associated with current and expected future land uses in the Project vicinity, primarily agricultural activities and scattered rural residential development.

Impacts to vegetation from development of the Kittitas Valley, Wild Horse and Vantage wind power projects would be similar to those described for the Desert Claim Project, generally consisting of localized impacts to the same types of vegetation communities, and would be mitigated in a similar manner in accordance with the WDFW guidelines. The permanent footprint for the Kittitas Valley project as presently configured would displace a somewhat smaller acreage than would the Desert Claim proposal, as would the Vantage Wind Power Project. The analysis of the original Wild Horse Project indicated approximately 165 total acres would be displaced, including 87 acres of shrub-steppe habitat; those figures would be increased somewhat with the proposed expansion of the Project. For each project, the area of existing vegetation permanently displaced by the Project facilities amounts to a small portion (approximately 2 percent or less) of the respective project area. The combined impacts for the four projects amount to approximately 350 to 400 total acres of existing vegetation lost, of which less than half would be shrub-steppe habitat. Based on the limited incremental loss of native vegetation relative to the local distribution of these communities, the combined effects of the three projects would not represent a significant cumulative impact on local vegetation communities. In addition, mitigation measures for each project include replacement of lost habitat, according to the WDFW mitigation ratios.

In addition to direct loss of shrub-steppe and other native habitat types, fragmentation of habitat has been identified as a resource management concern. Compensatory mitigation parcels identified in connection with the Habitat Mitigation Plan will help to reduce fragmentation. In a more regional context, a key factor is the continued maintenance of large areas of protected grassland, shrub-steppe, and sagebrush communities within the Colockum, Quilomene, and L.T. Murray wildlife areas and the Yakima Training Center.

Environmental documentation for the respective projects also indicates that the minimal potential impacts of the proposed wind projects on rare plants would not represent a significant cumulative impact to any species.

3.2.1.6 Significant Unavoidable Adverse Impacts

There would be approximately 86 acres (less than 2 percent of the Project Area) of unavoidable displacement of existing vegetation with development of the Project. These impacts are not considered significant because they would not result in elimination of an entire vegetation type in the Project Area, loss of 10 percent or more of a priority habitat in the Project Area, or a decrease in species richness resulting from the loss of a plant population in the Project Area. No significant unavoidable adverse impacts to rare plants from construction, operation or decommissioning of the proposed Project are expected. Similarly, the Project is not expected to result in significant unavoidable adverse impacts related to potential introduction or spread of noxious weeds.

3.2.2 Wetlands

3.2.2.1 Summary of Prior Environmental Information

Information about wetland resources is found in the Desert Claim Final EIS, Section 3.4.2. The formerly proposed site (5,237 acres) contained 76 wetlands, primarily categorized as palustrine or fresh water emergent. None support fish or other protected species, although some are hydrologically connected to perennial streams or associated riparian corridors. Construction of the prior Project proposal (120 turbines, roads, power collection system, and substation) was estimated to cause temporary impacts to 17.06 acres of wetland and buffer, and permanent impacts to 3.23 acres.

3.2.2.2 Affected Environment

The region surrounding the proposed Project site is comprised predominately of upland environment and can be described as open country with shrub-steppe-covered rolling hills and flats. Typically, the dry environment of eastern Washington limits wetland areas to the immediate vicinity of perennial streams, seeps, and springs.

A reconnaissance-level survey of the WDNR parcel was conducted in July 2006. Approximately 10 wetlands were observed, generally associated with, or located between, on-site streams. These wetlands were not formally delineated, but their general locations were mapped and characteristics were recorded. Streams were delineated and evaluated.

A survey of the private property in the southwest portion of the Project Area was conducted in July 2008. No wetlands were observed during this investigation. On-site streams were delineated and evaluated.

Sixty-seven wetlands were identified, evaluated, and delineated within the Project site. Wetlands were classified using the definitions and standards contained in Kittitas County's Critical Area regulations (KCC 17A.04). More detailed information regarding the wetland delineation is

contained in the Desert Claim Final EIS and Appendix B of the ASC, Stream and Wetland Delineation Report.

Of the 67 wetlands evaluated on site, 65 were classified as Category III, defined to include wetlands that do not meet the criteria for Categories I, II or IV, and which have a habitat value rating of 21 points or less. An 80-foot buffer is required for Category III wetlands. Two wetlands were classified as Category IV, which are defined as either: (i) hydrologically isolated wetlands that are less than or equal to one acre in size, have only one wetland class, and are dominated (greater than 80 percent aerial cover) by a single non-native plant species; or (ii) hydrologically isolated wetlands that are less than or equal to two acres in size, have only one wetland class, and greater than 90 percent aerial cover of non-native plant species. A 25-foot buffer is required for Category IV wetlands.

3.2.2.3 Significant Impacts

Desert Claim Revised Proposal

The revised Project proposal is not expected to result in any temporary or permanent impacts to wetlands. The revised proposal has been designed and would use micro-siting to locate turbines, roads, and other project facilities so as to avoid wetlands impacts. Two wetlands would be crossed by the proposed power collection system. To avoid potential impacts, these crossings are proposed to be accomplished by boring underneath the wetlands, bridging the wetlands, or using above ground power poles.

Potential indirect impacts would be the same as identified in the Desert Claim Final EIS.

No Action

As described in the Desert Claim Final EIS, under the No Action alternative, the proposed wind power facility would not be constructed and no project-related impacts to wetlands would occur. However, past and current effects to wetlands—such as in conjunction with rural residential development or ongoing agricultural activities—would continue for the foreseeable future. Conversion of land for low density rural residential uses could occur over the long term and could result in direct and indirect impacts to wetlands. Such effects cannot be quantified.

3.2.2.4 Mitigation Measures

Mitigation measures have been incorporated into the proposal so that no wetland impacts would occur. No additional mitigation measures are required.

Any work adjacent to wetlands would adhere to applicable federal, state and local regulations and would be addressed in the Stormwater Discharge Permit, SWPPP, and TESCP.

3.2.2.5 Cumulative Impacts

In general, impacts to wetlands have been or would be avoided by each of the approved or proposed wind power projects through site planning and micro-siting of individual turbines.

As identified above, no temporary or permanent wetland impacts are expected to occur as a result of the revised Desert Claim proposal. Impacts identified for the Kittitas Valley Project (DEIS Addendum 2005) would be limited to 165 square feet (.00375 acre) of intrusion in two small wetlands in conjunction with road construction. No wetlands were identified on the Wild Horse site and no impacts would occur. Similarly, no wetland impacts were identified for the Vantage Wind Power Project.

3.2.2.6 Significant Unavoidable Adverse Impacts

All potential temporary and permanent wetland impacts would be avoided, and no significant unavoidable adverse impacts to wetlands would occur as a result of the proposal.

3.2.3 Wildlife (Birds and Bats)

3.2.3.1 Summary of Prior Environmental Information

The Desert Claim Final EIS documented an extensive inventory of wildlife resources within and near the Project Area for the original proposal and an analysis of the impacts of project development on those resources. The analysis indicated that loss of wildlife and/or habitat from construction would have minor impacts. Impacts from project operation would primarily involve risk of collision impacts for birds and bats. The rate of bird fatalities was expected to be within the range of mortality that has been observed at other wind projects in the Northwest, and was estimated at 140 to 220 total birds per year. Passerines were expected to comprise the largest share of fatalities, and the European starling, western meadowlark and American robin were identified as the individual species most at risk. The potential impacts to wildlife were not considered to be significant relative to the size of species populations. The Final EIS described a variety of mitigation measures intended to minimize wildlife impacts and monitor conditions with the Project in operation.

3.2.3.2 Affected Environment

The Desert Claim Final EIS provided extensive information on baseline conditions for birds (including data specific to raptors), bats, big game, small mammals, reptiles and amphibians, and threatened and endangered wildlife species in the vicinity of the Project. That information remains valid for the current proposal, and is reflected in the impact analysis presented in Section 3.2.3.3.

3.2.3.3 Significant Impacts

The following section describes impacts to birds, bats and other wildlife expected to result from construction and operation of the revised Project. The analysis focuses on anticipated changes to impacts from the original layout and potential cumulative effects from other wind projects in Kittitas County. In addition, the analysis incorporates new information that has become available since the Final EIS. When the Final EIS was prepared in 2003-2004, biologists typically estimated avian impacts based on per-turbine fatality rates developed by comparing mortality results from studies at similar wind projects. Because of large differences in turbine sizes among various projects and the availability of more project data, biologists have now begun to use a different approach. The approach is to standardize data on a per-MW basis for predicting fatality impacts. This approach assumes that the mortality rates are proportional to the MW capacity of the turbine, which is nearly equivalent to assuming mortality is proportional to the rotor-swept area of the turbine. The analysis presented below uses the approach based on turbine MW nameplate capacity.

Desert Claim Revised Proposal

Birds

Construction Impacts

Wind plant construction could affect birds through loss of habitat, potential fatalities from construction equipment, and disturbance/displacement effects from construction and human occupation of the area. Habitat impacts are slightly less compared to the 2004 Final EIS because the number of turbines has been reduced, thereby reducing the overall footprint of turbine pads and associated facilities. Consequently, potential impacts from construction equipment and disturbance/displacement effects will likely be slightly lower than the previous proposal, due to the smaller number of turbines and less time needed to complete the Project. Potential mortality from construction equipment on site is expected to be low and similar to other wind projects. The risk of bird mortality from construction is most likely limited to potential destruction of a nest with eggs or young for ground- and shrub-nesting species (such as Vespar sparrow and western meadowlark) when equipment initially disturbs the habitat. Because less native vegetation will be disturbed in connection with the current proposal compared to the proposal considered in the Final EIS, the risk of destruction of a nest with eggs or young will be lower. In addition, compared to the original proposal, the disturbance area for the revised project includes a greater proportion of grassland (primarily pasture) vegetation and lesser acreages of riparian forest, riparian shrub, shrub-steppe, and wet meadow; the latter habitat types are more likely than grassland to be used by birds for nesting and foraging. Disturbance-type impacts can be expected to occur if construction activity occurs near an active nest or primary foraging area.

Based on the previous avian studies for the Project, raptor nest density in the original project area and within a 2-mile buffer of the site was 0.28 nest/mi^2 (0.11 nest/km^2) for buteos and 0.34 nest/mi^2 (0.13 nest/km^2) for all raptors. Raptor nest density around the new proposal, including a 2-mile buffer, is 0.18 nest/mi^2 (0.07 nest/km^2) for buteos and 0.20 nest/mi^2 (0.08 nest/km^2) for all raptors. The best raptor nesting habitat in the Project vicinity is located along the Wilson Creek riparian corridor east of the site and along the numerous transmission lines within the Project Area. Nests closer to proposed turbines within the site are more likely to be affected by Project activities and may experience disturbance or displacement effects to the point that raptors do not return and use those nests. Compared to the original proposal, this potential impact would be less with the new Desert Claim proposal due to the lower nest density in the revised Project Area. The 2003 nest survey indicated there were only 2 active raptor nests (both red-tailed hawks) within 0.5 mile of the new Project boundary. Higher nest densities occurred in the southeast part of the original project area, and that area has been dropped from the Project as now proposed. In addition, Wilson Creek falls outside the 2-mile buffer of the new site. It is unlikely that construction of the proposed Project would result in significant disturbance or displacement impacts on nesting raptors.

Operation Impacts

Estimates of Mortality Due to Turbines. Mortality impacts of the proposed Project are projected primarily based on data collected at 11 existing regional wind power facilities (see **Table 3.2-3**). Monitoring studies at these projects were all similar in scope, and the mortality estimates for all projects except Condon were adjusted for bird and bat carcass removal and searcher efficiency biases.

All Raptors. Compared to other wind projects studied in the region, raptor (defined as buteos, accipiters, eagles, falcons) use for the Desert Claim site was slightly above average, with the equivalent of 0.72 raptors observed for a 20-minute survey. The majority of the raptor sightings during the spring, summer, and fall were red-tailed hawks, and rough-legged hawks during the winter. Raptor mortality for the 11 listed wind projects in Washington and Oregon (see Table 3.2-3) ranged from 0 to 0.15 fatalities per MW per year, with an average of 0.07 fatalities per MW per year. Considering these mortality results and raptor use estimates at these wind projects, it is estimated that potential raptor mortality at the proposed Project could be higher than average. Using the raptor mortality rates from projects in the region, potential raptor mortality at Desert Claim would be expected to range from 0 to 29 per year.

Table 3.2-3. Avian Use Estimates and Avian Fatality Estimates for Wind Power Projects in the Columbia Plateau Ecoregion

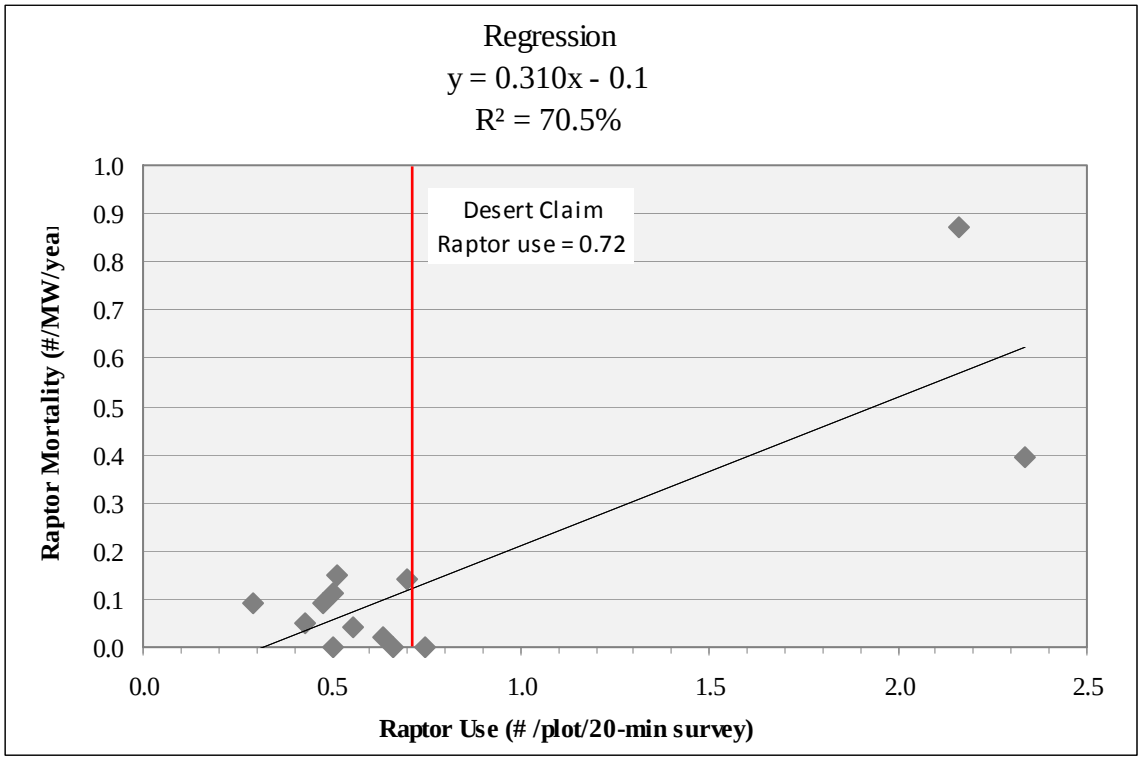
Project	Mean Annual Avian Use (#/20-min survey)		Mean Annual Mortality (#/MW/year)			Source
	Raptors	All Birds	Raptors	All Birds	Nocturnal Migrants	
Combine Hills, OR	0.60	6.0	0	2.6	0.27	Young et al. 2005
Klondike, I OR	0.47	17.5	0	0.9	0.35	Johnson et al. 2003
Klondike II, OR	0.47	17.5	0.11	3.1	2.11	NWC and WEST, 2007
Vansycle, OR	0.41	13.1	0	1.0	0.32	Erickson et al. 2000
Stateline, WA/OR	0.41	13.1	0.10	2.4	0.78	Erickson et al. 2004, 2007
Hopkins Ridge, WA	0.64	8.7	0.14	1.2	0.46	Young et al. 2007
Nine Canyon, WA	0.26	9.4	0.05	2.8	0.45	Erickson et al. 2003
Wild Horse, WA	0.40	5.0	0.09	1.6	0.88	Erickson et al. 2008
Bighorn I, WA	0.90	16.6	0.15	2.6	0.57	Kronner et al. 2008
Leaning Juniper, OR	0.52	23.6	0.06	3.2	na	Kronner et al. 2007
Condon, OR	0.37	5.8	0.02[1]	0.05[1]	NR	Fishman Ecological Services 2003
Mean	**0.50**	**12.4**	**0.07**	**2.1**	**0.69**	

[1] Not adjusted for searcher efficiency or scavenger removal; study methods differed from other projects and were not as rigorous; therefore this estimate should be regarded as a minimum mortality estimate and it was not used in calculation of the mean values.

A more recent analysis of results from multiple projects (**Figure 3.2-2**), including numerous studies in the Columbia Plateau region, suggests that there is a correlation between raptor use and raptor mortality. The relationship between raptor use (standardized to 20-minute surveys) and raptor mortality (adjusted for site-specific estimates of carcass removal and searcher efficiency) was plotted for 13 wind projects studied since 2002. A strong relationship is apparent in this analysis. Two California projects (High Winds and Diablo Winds) have very high raptor use, and much higher raptor mortality than Pacific Northwest and Mid-west projects. (Note that raptor use in this analysis does not include vultures, and that raptor use at the Desert Claim site was analyzed to include just the first 20 minutes of surveys [Young et al. 2003] and to exclude turkey vultures, so that it could be accurately compared to the regression results.

Applying the regression model from this method and the estimated raptor use for the Desert Claim Project (0.72/survey), raptor fatalities for the Project are predicted at 0.12 MW/year, or 23 raptors per year for the entire project. This result is within the range of mortality predicted based solely on fatality rates at the other regional projects (as indicated in **Table 3.2-3**).

These estimates indicate the Project would not result in any population-level consequences (e.g., within the Kittitas Valley, within the Columbia Plateau, or some larger population) for the raptor species likely to be affected. For example, most fatalities are likely to be red-tailed hawks and American kestrels, and these two species are the most common raptor in the Kittitas Valley, as



Study and Location	Raptor Use	Source	Raptor Mortality	Source
Buffalo Ridge, MN	0.64	Erickson et al. 2002	0.02	Johnson et al. 2000
Combine Hills, OR	0.75	Young et al. 2003c	0.00	Young et al. 2005
Diablo Winds, CA	2.16	WEST 2006a	0.87	WEST 2006a
Foote Creek Rim, WY	0.55	Erickson et al. 2002	0.04	Young et al. 2003b
High Winds, CA	2.34	Kerlinger et al. 2005	0.39	Kerlinger et al. 2006
Hopkins Ridge, WA	0.70	Young et al. 2003d	0.14	Young et al. 2007
Klondike II, OR	0.50	Johnson 2004	0.11	NWC and WEST 2007
Klondike, OR	0.50	Johnson et al. 2002	0.00	Johnson et al. 2003
Stateline, WA/OR	0.48	Erickson et al. 2002	0.09	Erickson et al. 2002
Vansycle, OR	0.66	WCIA and WEST 1997	0.00	Erickson et al. 2002
Big Horn, WA	0.51	Kronner et al. 2008a	0.15	Kronner et al. 2008b
Wild Horse, WA	0.29	Erickson et al. 2003c	0.09	Erickson et al. 2008
Nine Canyon, WA	0.43	Erickson et al. 2002	0.05	Erickson et al. 2003b

Figure 3.2-2. Relationship between Raptor Use and Mortality for 13 Wind Projects Studied Since 2002

well as in the Columbia Plateau and nationally. Also, based on results from other monitoring studies in the Columbia Plateau (see Table 3.2-3), impacts would be distributed among both adults and juveniles and would be spread throughout the year, thereby potentially affecting both migrants and winter residents. Based on results data from the USGS Breeding Bird Survey (BBS) routes in the Columbia Plateau over the past 20 years (Sauer et al. 2006), the estimated breeding populations for these two species in the Columbia Plateau are approximately 5,890 kestrels and 7,035 red-tailed hawks in the ecoregion (see discussion of cumulative impacts below). Assuming the annual raptor fatality level of 23 raptors estimated above would be equally divided between kestrels (12 individuals) and red-tailed hawks (12 individuals) and that half of the fatalities occur during the breeding season, the estimated annual fatalities represent 0.10 percent of the kestrel breeding population and 0.08 percent of the red-tail breeding population within the Columbia Plateau.

Bald Eagles. Bald eagles were documented occurring in the study area in 2002 during the winter months. It is known that bald eagles continue to occur in the Kittitas Valley during the winter months, and they have likely increased in number. The annual Ellensburg Christmas Bird Count has documented an increasing number of bald eagles in recent years. Since the wind project was originally proposed, the bald eagle has been removed from the list of federally threatened species, indicating recovery of the species and documented population growth.

Bald eagle use estimates for the Desert Claim Project are similar to the bald eagle use estimates for other wind project sites in the Columbia Plateau Ecoregion. The chance of a bald eagle fatality is not expected to be any different than at other wind projects in the region.

The Final EIS concluded that while bald eagles flying within the Project Area would have some exposure to wind turbines, any mortality that might occur would be at a very low level and, if it occurred, would not have a measurable effect on the bald eagle population. The Final EIS noted that there had been no documented bald eagle fatalities at wind energy projects, which is still the case.

The new project configuration does not change the conclusions from the Final EIS regarding impacts to bald eagles. There is still a possibility of collision with turbines. However, the absence of any recorded bald eagle fatalities at other wind projects suggests that the species is at a lower risk of turbine collision than other raptor species. The fact that bald eagles are found in the Project Area during the least windy time of the year also reduces the risk to eagles. In any event, project operation is expected to result in minimal effect on the regional eagle population.

WDFW biologists have noted a potential risk to bald eagles during the calving season, because calving activity (primarily, the existence of afterbirth material as a food source) can attract bald eagles. Local ranchers currently conduct calving within fenced areas in the Project Area, and

would continue to do so with the Project in operation. To minimize the risk to bald eagles, the Applicant has agreed to several additional mitigation measures as documented in the Stipulation with the CFE and the Agreement with WDFW (see Section 3.2.3.4).

Passerines. Passerines have been the most abundant fatalities at other wind projects studied, often composing more than 80 percent of total avian mortality. Both migrant and resident passerine fatalities have been observed. Given that passerines make up the vast majority of avian observations on-site, it is expected that passerines would make up the largest proportion of fatalities. As with raptor fatality estimates, biologists now generally estimate passerine mortality for wind projects on a per-MW rather than a per-turbine basis. Considering the available data from existing regional wind projects and the fact that passerines make up approximately 70 percent of bird fatalities at wind projects in the Pacific Northwest (**Table 3.2-4**), it is estimated that potential passerine mortality at the proposed Project would be approximately 1.47 birds per MW per year. This would result in approximately 280 passerine fatalities per year at the Desert Claim Project with 190 MW of capacity developed. Applying the range of mortality rates from Northwest projects (**Table 3.2-3**), annual passerine fatalities at the Project would range from approximately 50 to 400.

Table 3.2-4. Percent Composition of Avian Fatalities by Species Group for Existing Columbia Plateau Ecoregion (WA, OR) Wind Energy Facilities

Species	Number of Fatalities	Percent Composition
Passerines	461	69.5
Upland gamebirds	96	14.5
Raptors	57	8.6
Doves/pigeons	21	3.2
Waterbirds/waterfowl/shorebirds	11	1.7
Other birds[1]	17	2.6
Totals	663	100

[1] woodpeckers, nighthawks, swifts

Waterfowl. Little waterfowl mortality has been documented at other wind projects. The most common waterfowl species observed in the Project Area were mallard, Canada goose, and northern pintail, and were seen mainly in winter. A variety of other waterfowl species were seen incidentally in the study area. Some waterfowl mortality at the Project could be expected, likely composed mostly of mallards; however, the total number of anticipated fatalities is low. While mallards were seen year round, the majority of waterfowl use was during winter and in the western portions of the original Project Area. Potential impacts to waterfowl would not be expected to change based on the new proposal because the portion of the original Project not included in the current proposal was primarily shrub-steppe vegetation that had little waterfowl use.

Total Avian Mortality. The range of bird mortality for the 10 regional wind projects listed above for which fatality counts were adjusted for bias (searcher efficiency, carcass removal) is approximately 0.9 to 3.2 birds per MW per year for all birds, and the average is 2.1 birds per MW per year (**Table 3.2-3**). Using this range, avian mortality at the proposed Project would be approximately 171 to 608 birds per year with a Project capacity of 190 MW. Because the total capacity has increased by 10 MW, compared to the original proposal, this approach yields a slightly higher avian mortality estimate for the new Project than would have been predicted for the original project proposal.

Carcass searches at other wind projects have found avian fatalities associated with guyed met towers, but not with un-guyed towers. The proposed Project would have four permanent, un-guyed met towers. Based on the result of the above studies, no avian fatalities associated with these met towers are expected.

Bats

Research at other wind projects indicates that the primary impact to bats appears to be risk of collision for fall migratory species. The hoary bat (*Lasiurus cinereus*) and silver-haired bat (*Lasionycteris noctivagans*) are the species with the most prevalent wind project fatalities in the Pacific Northwest (**Table 3.2-5**; Johnson 2005). Sparse information exists regarding bat populations in the region; however, non-migratory and resident bat populations do not appear to be negatively impacted by wind turbines (see Johnson 2005). The wind project monitoring studies within the region have found very little impact to resident bats, with very low numbers of resident bat species (little brown bats, big brown bats) being observed among the fatalities.

Table 3.2-5. Number and Species Composition of Bat Fatalities Found at Wind Projects in the Columbia Plateau Region

Species	Number of Fatalities	Percent Composition
Silver-haired bat	163	48.4
Hoary bat	152	45.1
Unidentified bat	8	2.7
Little brown bat	8	2.4
Big brown bat	5	1.5
Totals (4 species)	337	100

Fatality estimates for ten Northwest wind projects studied have ranged from 0.39 to 2.46 bats per MW per year, with an average of 1.18 bats per MW per year (**Table 3.2-6**). In these studies more than 90 percent of the bat fatalities have been hoary and silver-haired bats. Bat mortality at the Desert Claim Project is not expected to greatly exceed mortality at the other regional wind projects. The 2004 Final EIS had speculated that bat mortality at the Desert Claim site could be higher due to the proximity of forests to the north and west, and some projects in other parts of

Table 3.2-6. Mean Bat Mortality Estimates Based on Fatalities Found at Wind Projects in the Columbia Plateau Region

Project Name (state)	No. Bats/turbine/year	Bats per MW[1]	Reference
Stateline (OR/WA)	0.95	1.44	Erickson et al. 2004, 2007
Vansycle (OR)	0.74	1.12	Erickson et al. 2000
Klondike (OR)	1.16	0.77	Johnson et al. 2003
Klondike II (OR)	0.63	0.41	NWC and WEST, Inc. 2007
Hopkins Ridge (WA)	1.13	0.63	Young et al 2007
Wild Horse (WA)	0.70	0.39	Erickson et al. 2008
Nine Canyon (WA)	3.21	2.46	Erickson et al. 2003b
Leaning Juniper (OR)	1.28	0.86	Kronner et al. 2007
Big Horn I (WA)	2.85	1.90	Kronner et al. 2008
Combine Hills (OR)	1.88	1.88	Young et al. 2005
Average	**1.46**	**1.18**	

[1] Most reports do not provide number per MW of energy produced so this number was calculated based on the mortality per turbine and capacity of turbines studied.

the country have shown that risk to bats may be greater in forested environments (e.g., Kerns and Kerlinger 2004, Nicholson 2003). The revised Project Area is farther away from forested habitat to the north and west than was the original Project Area, however, and other wind projects in the region are in similar proximity to forests without resulting high bat mortality.

Using a per-MW estimation basis, bat mortality at the Desert Claim site may be approximately 0.4 to 2.5 bats per MW per year, or between 76 and 475 total bats per year with a 190 MW capacity. This range is a similar to the mortality estimated for the original proposal.

Provided bat mortality at the Desert Claim project is similar to the rates at other Columbia Plateau wind projects, impacts to resident and non-migratory species would be minor and not significant. The low level of mortality impacts for Myotis species and big brown bats would be to individuals and not populations, are not considered significant, and would likely be less than natural levels of variation in mortality for these species. This would also hold true for the cumulative impact from all local wind projects (see subsequent discussion).

Unlike the situation with birds, there is little information available about local, regional or national populations of bat species. For most species that are not threatened or endangered and have large geographic distributions, very little is known about numbers that exist. Results of monitoring studies across the U.S. and Canada have found similar trends in impacts, such as finding that risk to bats from wind turbines is unequal across species and across seasons. The majority of bat fatalities at wind projects in the U.S. and Canada have been tree/forest dwelling, long-distance migrant species found in the late summer and fall periods. Species in the *Lasiurus* genus, hoary bat in the west and red bat (*L. borealis*) in the east, and silver-haired bats have been the most abundant fatalities found at wind projects. Numerous studies across the U.S. and Canada have shown this trend (see Johnson 2005). The highest mortality has occurred during

what is believed to be the post-breeding dispersal and fall migration period for bats, from roughly late July through September. Numerous studies across the U.S. and Canada have also shown this trend (see Johnson 2005). Much lower mortality rates, and particularly in the Columbia Plateau Ecoregion, have occurred in the spring and summer.

Hoary bats and silver-haired bats generally occupy forested or treed habitats during the breeding season. This type of habitat is distinctly lacking and localized throughout the Columbia Plateau Ecoregion, but is present adjacent to the wind projects proposed in Kittitas County. Monitoring of the nearby Wild Horse wind project did not suggest that the nearby forest influenced bat mortality, however. The impacts to bats at Wild Horse were similar to rates for the other Columbia Plateau wind projects and were on the low end of the range of bat mortality (see **Table 3.2-6**).

The significance of the potential Project impact on hoary and silver-haired bat populations is difficult to determine, as there is very little information available regarding the overall population size and distribution of the bats potentially affected. Hoary bats and silver-haired bats are two of the most widely distributed bat species in North America (Shump and Shump 1982; Kunz 1982) and it is likely that, due to the size of the species ranges, that they have fairly large population sizes. Unlike many bird species that may have multiple clutches of multiple young per year, hoary bats and silver-haired bats typically raise only one or two young per year and only breed once per year (Shump and Shump 1982; Kunz 1982). Consequently, it is possible that the loss of breeding individuals to bat populations such as these may have greater consequences than for birds. Bats tend to live longer than birds, however, and may have a longer breeding lifespan. Because of uncertainties such as these, the long-term consequences of mortality on long-lived, low-fecundity species such as bats are generally unknown.

Other Wildlife

Compared to the original proposal, no significant changes to impacts on other wildlife such as small mammals, reptiles and amphibians, fish, big game, and federally listed species are expected for the revised Desert Claim project. Impacts to these other wildlife species would remain as described in the 2006 EFSEC application for the Project.

No Action

Under the No Action alternative the existing wildlife conditions within the Project Area would remain generally as they are, subject to ongoing local changes associated with agricultural operations and rural residential development and more broad-based regional trends affecting wildlife. No impacts to existing wildlife populations, including protected species, would occur as a result of wind energy development in the Project Area.

3.2.3.4 Mitigation Measures

Measures to mitigate impacts to wildlife described in the Desert Claim Final EIS remain applicable to the revised Project. Briefly, these include:

- use of BMPs during construction to minimize the potential for disturbance such as confining construction equipment to defined construction corridors and implementing measures to control noxious weeds;
- timing construction activities to reduce impacts such as conducting clearing and grubbing activities outside the breeding season to the extent possible;
- use of standard design measures to minimize wildlife interactions such as buried collector lines, tubular turbine towers, and un-guyed met towers; and
- a program of post-construction monitoring, focusing on effects to birds, bats and mule deer and consistent with the WDFW guidelines.

Subsequent to the publication of the Draft SEIS, the Applicant agreed to several additional mitigation measures as documented in the Stipulation with the CFE and the Agreement with WDFW. With respect to mitigation of wildlife impacts, these documents address the following measures:

- development and implementation of a Habitat Mitigation Plan
- use of project design and construction procedures to avoid or minimize habitat impacts
- assignment of an Independent Environmental Monitor during construction
- specific bald eagle, raptor, and avian mitigation measures during Project operation
- development and implementation of an Avian Monitoring Plan covering the first 2 years of the post-construction period
- performance of a bat survey prior to commercial operation of the Project
- creation and operation of a TAC to review and address results of monitoring data
- cooperation in management efforts related to deer and elk in the project vicinity

Among other wildlife-related measures, to protect bald eagles the Applicant has agreed not to locate turbines within the fenced calving areas or surrounding buffer, and to remove carcasses and afterbirths promptly. The Applicant has also agreed to conduct a bald eagle study during the calving season in the first 2 years of the Project's operation and to present the results of the study to the TAC, which can consider whether to recommend additional mitigation measures.

3.2.3.5 Cumulative Impacts

The methodology used to identify cumulative impacts, and supporting data and graphics, are described in detail in Johnson & Erickson (2008). The geographic area that was used to estimate cumulative impacts is identified as the Columbia Plateau Ecoregion, which includes southeastern Washington, including Kittitas County, and northeastern Oregon; refer to Johnson & Erickson, 2008, Figure 1. The cumulative impact area includes 17 existing and 30 proposed wind energy facilities, totaling almost 6,700 MW. This total was used to estimate cumulative mortality, even though it is unlikely that all of the proposed projects will be constructed. Estimates for the four existing, approved, and proposed wind power facilities in Kittitas County are also provided. The Wild Horse project has been monitored for fatalities for one year (2007) (Erickson et al. 2008). Results of this monitoring study were included in the estimation of potential project impacts above (see **Table 3.2-3**). The cumulative estimates are believed to be conservative, since it is unlikely that all proposed facilities will be approved and constructed.

Raptors

An updated mortality analysis has been developed for the Desert Claim Project using recent information on wind project impacts (as described above). This analysis estimated the range of raptor mortality would be from 0 to 29 raptors per year for the Desert Claim Project. Provided all four of the Kittitas County wind projects are eventually constructed, and raptor mortality is similar for each project, the total estimated annual raptor mortality for the County due to wind turbines would range from approximately 0 to 116. In 2007, raptor mortality at the Wild Horse project was estimated at 0.09 per MW. The total raptor mortality for the project was estimated at 20 for the year. Because the Desert Claim, Kittitas Valley, and Vantage projects are smaller in size than the Wild Horse project, the total cumulative annual impact to raptors is not expected to be greater than 80 for all four projects. In a previous analysis of cumulative impacts on birds for the entire Columbia Plateau, Johnson and Erickson (2008) estimated that an additional annual mortality of 469 raptors could be attributable to approximately 6,700 MW of existing and proposed wind energy projects within the Columbia Plateau.

In order to determine if this predicted mortality would be considered significant, it was assumed that raptors within the Columbia Plateau physiographic region (ecoregion) would be the populations most likely affected. While local populations of raptors are somewhat difficult to define, birds within the Columbia Plateau Ecoregion may easily intermix without any major geographic or topographic barrier, so more local populations (e.g., within the Kittitas Valley) are not isolated or separated from the larger regional population.

Based on their relative abundance (observed use of the site; see Young et al. 2003a) and mortality at other Northwest wind projects, the two species expected to compose a majority of the raptor fatalities are the American kestrel and red-tailed hawk. Five of the six raptor fatalities

observed at Wild Horse were American kestrel or red-tailed hawks. These two species were among the three most common raptors observed during the baseline studies for all four wind projects in Kittitas County (based on use estimates), and they are one of the most common raptors observed during BBS surveys (Sauer et al. 2006) and Christmas bird counts in Kittitas County (National Audubon Society 2006). These two species are also the two most commonly reported raptor species among fatalities at modern wind projects (see Erickson et al. 2001, 2002), and they account for more than 63 percent of the raptor fatalities recorded at the regional wind projects studied.

Based on results data from the USGS BBS routes in the Columbia Plateau over the past 20 years, the breeding populations for these two species in the Columbia Plateau ecoregion are approximately 5,890 kestrels and 7,035 red-tailed hawks. Cade (1982) estimated the North American breeding population of American kestrels at greater than 1.2 million pairs. Reported estimates of the total red-tailed hawk population in the U.S. have ranged between 300,000 and 1,000,000 (Preston and Beane 1993).

Given the size of the regional population of the American kestrel and red-tailed hawk, neither the estimated Project impact nor estimated cumulative impact of the four wind projects in Kittitas County will be significant at the Columbia Plateau population level. Previous analyses of the cumulative impact of 6,700 MW of existing and proposed wind projects for the entire Columbia Plateau physiographic region have reached a similar conclusion (Johnson and Erickson 2008, Young and Poulton 2007). Similar to the county-level analysis, the level of wind turbine development proposed for the Columbia Plateau region is not expected to have a cumulative impact on raptor populations. Johnson and Erickson (2008) concluded that the additional annual mortality of 469 attributable to approximately 6,700 MW of wind energy within the Columbia Plateau would not have measurable population consequences. That is, the additional wind-project mortality of from 0.5 to 1 percent for different species was far less than the total annual mortality estimates of approximately 20 to 30 percent for adults and approximately 40 to 60 percent for juveniles indicated in other scientific studies (Johnson and Erickson 2008). The overall conclusions of the cumulative effects analyses for the entire Columbia Plateau were that the additional mortality associated with wind development in the region would not have population consequences.

Performing comparable quantitative analyses for bald and golden eagles would not be appropriate. In the case of bald eagles, there have not been any recorded bald eagle fatalities at operating wind plants in the Columbia Plateau Ecoregion and, therefore, there is no mortality rate that can be applied to the baseline use level for the species. Although it is possible that a bald eagle may be killed at a wind project at some time in the future, no significant impact to the bald eagle population is expected. For golden eagles, baseline use of the Project Area is

minimal, and mortality for this species is expected to be nearly zero. Therefore, the Desert Claim Project would not contribute measurably to the potential for cumulative impacts to the regional golden eagle population.

Other Birds

Passerines have been the most abundant avian fatality at wind projects studied (see Erickson et al. 2000, 2001, 2002; Johnson et al. 2002; Young et al. 2003b, 2005, 2007), often representing more than 80 percent of the avian fatalities. For projects in the Columbia Plateau ecoregion, on average approximately 70 percent of the avian fatalities have been passerines. Both migrant and resident passerine fatalities have been observed, with migrants generally making up 20 to 30 percent of the avian fatalities.

For most studies that have occurred in agricultural settings, a few common species make up the majority of bird observations and fatalities at the site. A variety of other species, including migrants, have been recorded as fatalities, but typically in low numbers and frequency. The majority of avian deaths (70 percent) due to wind power facilities in the Columbia Plateau region were of common passerines in mixed agriculture and grassland habitat. Horned larks have been the most common fatality at most of the projects studied. For example at the Stateline, Combine Hills, and Nine Canyon I projects, horned larks were 39 percent, 41 percent, and 47 percent of all avian fatalities, respectively and a much higher percentage of the passerine fatalities. At Wild Horse, horned lark was also the most common avian fatality (14 percent or all birds; 20 percent of passerines) despite the lack of cultivated agriculture at the site, which tends to increase horned lark numbers. Other shrub-steppe and open country passerines, such as western meadowlarks and European starling, were also found regularly. For example, European starling made up 18 percent of the fatalities at the Hopkins Ridge project (Young et al. 2007).

The expected number of fatalities from Desert Claim alone or in combination with the other wind projects in Kittitas County would not be significant to the regional populations, in general simply because the regional populations are so large. For example, over all passerines recorded during the regional monitoring studies, horned lark made up over half (51 percent) of the fatalities. Assuming this pattern holds for the projects in Kittitas County, it is expected that on average there would be 190 horned lark fatalities per year for Desert Claim and approximately 635 horned lark fatalities for all four projects. This compares to an estimated regional population of approximately 111,000 horned larks based on the BBS results for the Columbia Plateau Ecoregion (Saur et al. 2006). Natural variation in the horned lark population is likely substantially higher than the estimated impacts. Impacts to other bird species are expected to be less based on the results of the other monitoring studies and comprise a much smaller percentage of the pool of fatalities from Columbia Plateau wind projects. These small impacts would be to

individuals and would not result in a significant impact to specific species or general populations.

Similarly, the total non-raptor bird mortality that would occur if 6,700 MW of existing, approved, and proposed wind energy facilities in the Columbia Plateau Ecoregion were constructed is estimated to be 14,070 annually. Previous analyses of this cumulative impact concluded that the proposed level of wind development in the region is unlikely to have consequences at the population level for birds (Johnson and Erickson 2008, Young and Poulton 2007). Conclusions from the analyses were that the total cumulative mortality impact associated with wind energy development would be approximately 0.05 percent of the breeding population of the species for which fatalities were most common, and far less for the species with fewer fatalities. For the vast majority of species recorded as wind project fatalities in the Columbia Plateau (11 wind projects monitored; Johnson and Erickson 2008), five or fewer fatalities have been found. This level of mortality is essentially immeasurable when compared to the total estimates of the breeding population sizes (Johnson and Erickson 2008, Young and Poulton 2007). The overall conclusion of the cumulative effects analyses for the entire Columbia Plateau was that the additional mortality associated with wind development in the region would not have population consequences.

Bats

The four wind projects proposed or constructed in Kittitas County represent a total of 755 MW of installed capacity, if all four projects are constructed as proposed. Based on the per-MW method for estimating potential bat mortalities, the four projects could result in a combined total of between 302 and 1,888 bat deaths annually in Kittitas County. Recent experience in the local area suggests the cumulative mortality would likely be toward the low end of the range indicated above. Total bat mortality at Wild Horse for 2007 was estimated at 89 individuals (Erickson et al. 2008). Provided the Desert Claim, Kittitas Valley, and Vantage projects have similar or lesser impacts than Wild Horse (due to their smaller generation capacities), there would be less than 356 total bat fatalities per year in Kittitas County due to wind turbines.

Johnson and Erickson (2008) estimated bat mortality for all existing, approved and proposed wind energy facilities in the Columbia Plateau Ecoregion at 7,906 annually. Previous analyses of cumulative impacts on bats for the whole Columbia Plateau physiographic region have concluded that the current and proposed level of wind energy development in the region is unlikely to have consequences at the population level, provided that the populations of the bat species likely to be impacted (hoary bats and silver-haired bats) are large and stable (Johnson and Erickson 2008, Young and Poulton 2007). As discussed in Section 3.2.2.3, hoary bats and silver-haired bats are two of the most widely-distributed bat species in North America and, because of their wide range, are thought to have fairly large population sizes. While there is

uncertainty over the actual population sizes for these species, the existing data do not suggest that the population sizes are sufficiently small that the limited level of potential mortality estimated would have a significant effect on the breeding population.

3.2.3.6 Significant Unavoidable Adverse Impacts

There would be unavoidable adverse impacts to several types of wildlife as a result of the Project. These would include temporary displacement of wildlife as a result of construction disturbance, loss of some individuals from immobile species during construction, loss of existing habitat within the construction footprint of the Project, and collision-related mortality of birds and bats during Project operation. These impacts are not considered significant because the impacts would be temporary, limited in extent or intensity, and/or would be mitigated. With respect to bird and bat mortality, the analysis determined that the mortality levels estimated for the Project would not represent significant population-level impacts for the species affected. With the mitigation measures identified, no significant unavoidable adverse impacts to birds or other wildlife are expected.

3.3 HISTORIC RESOURCES

3.3.1 Summary of Prior Environmental Analysis

The Desert Claim Final EIS identified possible expected adverse impacts to five cultural resource sites from development of the original Project proposal, which could be mitigated through avoidance of the sites during micro-siting. The document also indicated that any direct impacts to cultural resources that could not be avoided could be mitigated through an approved data recovery program developed in coordination with DAHP and affected Tribes, and that significant indirect impacts to the cultural resources in the Project vicinity were not anticipated.

3.3.2 Affected Environment

A Cultural Resources Assessment Addendum was prepared by Northwest Archaeological Associates in January 2009. The study evaluates the additional property included in the revised Desert Claim Project Area. The assessment, which includes an evaluation of the entire Desert Claim site, was submitted to the Department of Archaeology and Historic Preservation, but it is not included in the ASC or this SEIS because this information is considered confidential under state law (RCW 42.56.300) and federal law (16 USC 470w.3).

The Project Area is located in the upper Kittitas Valley at the western margin of the Columbia River Plateau, at elevations ranging from 2,000 to 2,680 feet (610 to 817 meters) above mean sea level. The vicinity of the Project is characterized by broad, gently sloping alluvial fans composed of Pleistocene-aged Kittitas drift and Thorp gravels (Fecht et al. 1987; Waitt 1979; Walsh et al. 1987). **Figure 3.3-1** shows the typical terrain of the Project Area. An unnamed

Figure 3.3-1. Project Overview during 2008 Field Survey, Vicinity of BPA Transmission Lines; View to the North

tributary of Dry Creek makes a low-gradient descent from the north through the western edge of the Project area, Green Canyon Creek and Reecer Creek descend through the middle of the Project Area, and Currier Creek descends east of the Project Area. Climatic conditions in the region support a shrub-steppe vegetation community dominated by sagebrush, lomatium, and perennial grasses that provide habitat for a variety of mammals and birds (Franklin and Dyrness 1973).

3.3.2.1 Cultural Setting

The Kittitas Valley forms the boundary between two major Native American linguistic groups: speakers of Interior Salish dialects to the north, and Sahaptin dialects to the south. The Project is within the traditional use area of people commonly referred to as the Kittitas Indians, a name derived from their important summer village *k'ti'tas*. The Kittitas referred to themselves as the *pswanwapum* and were the upper division of two groups whose territory encompassed the Yakima River drainage basin (Schuster 1998:349). Downstream from the Kittitas were the Lower Yakama, who occupied the Yakama River and its tributaries below Wenas Creek and portions of the Columbia River (Schuster 1975). Although their language is most closely related

to the Yakama, the Kittitas maintained close relations with Interior Salish people, particularly the Wenatchi to the north. Both linguistic groups followed a similar seasonal round organized around winter villages and seasonal forays to various resource procurement locations. In the spring, groups that had wintered together dispersed to root gathering and fishing locations. During the fall, forays into the foothills and mountains were organized to hunt game and gather berries (Ray 1936).

Euroamerican settlement of the Kittitas Valley began as early as the 1860s with small-scale cattle ranching, but by the 1880s, sheep surpassed cattle in importance because of their wider tolerance of different altitudes and more efficient grazing (Glauert and Kunz 1976). Early attempts at irrigation in the Valley diverted water from mountain streams into private or partnership ditches, but these sources of water were unreliable during the annual summer drought (Whitley 1949). These early irrigation networks, which tended to be small and affected limited acreage, were soon followed by larger, more complex federally assisted projects such as the North Branch canal, completed in 1929, which delineates a portion of the south boundary of the Project Area. Land use of the Project vicinity during the 20th century primarily focused on cattle ranching. During World War II, the Ellensburg Flying Service was displaced from the Ellensburg Air Base north of the town to a landing strip and facilities quickly built by the government in Section 30 that includes the southernmost portion of the additional Project Area (Kittitas County Centennial Committee 1989). The facilities were dismantled and the landing strip abandoned shortly after the war ended.

3.3.2.2 Previously Recorded Cultural Resources - 2003 Desert Claim Assessment

The initial field survey for the original Desert Claim proposal (Hodges et al. 2003) identified and recorded a total of 22 archaeological sites and 46 isolated finds within the lands now comprising the central and eastern portions of the revised Desert Claim Project Area. The sites include 10 historic sites, 7 pre-contact sites, and 2 dual-component sites. During the 2003 survey, 51 rock piles categorized as field clearing piles or fence jacks were noted but not recorded. Sites associated with standing structures and historic-period isolates without characteristics that were clearly diagnostic of a manufacture date were not given permanent trinomial state numbers by DAHP. (Sites recorded during the initial 2003 survey within the eastern segment of the original Project Area that is no longer under consideration for this Project are not included in the above discussion.)

3.3.2.3 Newly Recorded Cultural Resources

Subsequent field surveys conducted in 2006 and 2008 for the revised Desert Claim project proposal recorded 11 archaeological sites and 58 isolated finds. These totals include 5

archaeological sites and 31 isolated finds during the 2006 fieldwork, and 6 sites and 27 isolates recorded in 2008 (Northwest Archaeological Associates 2009).

The archaeological sites recorded during the 2006 and 2008 surveys are primarily pre-contact lithic scatters, ranging from three pieces of lithic debitage dispersed within 22 meters of each other (45-KT-2942) to a site with a large and diverse artifact assemblage comprised of debitage and formed and expedient lithic tools in an area of approximately 33,000 square meters (45-KT-2910). Two historic sites were also recorded: an irrigation ditch (45-KT-2790), and the remnants of the Ellensburg Auxiliary Airport (45-KT-2914). Further information, including sketch maps and photographs, may be found in their respective state inventory site forms filed with DAHP.

The combined record from the 2003, 2006, and 2008 surveys includes 30 archaeological sites and 103 isolated finds within the current Project Area. These documented resources represent Native American use of this landscape for at least the past several millennia, followed by several kinds of activity associated with post-Euroamerican settlement.

3.3.2.4 Site Significance Evaluations

The following evaluation, and the Historic and Cultural Resources Report submitted to the DAHP, uses criteria contained in the National Register of Historic Properties (NRHP) as a means to help identify "significant" resources. Distinguishing between categories of resources is a means to focus on significant adverse impacts, as required by SEPA, and to identify sites that satisfy NRHP Criterion D, which includes sites that may provide important archaeological information. It is acknowledged that Washington's Archaeological Sites and Resources Act (RCW 27.53) does not distinguish between historic and archaeological sites on the basis of significance. DAHP does use the NRHP criteria, however, to help evaluate sites. Other criteria that may be relevant to the site's resources relate to possible associations with culturally important events and people (NRHP criteria A and B), and the presence of TCPs. The Applicant has been consulting with the Yakama Nation to help identify these properties.

In August 2009, the Applicant and Yakama Nation entered into an MOU concerning surveys that will be performed prior to construction to identify traditionally important plants and root grounds, TCPs, and archaeological sites of interest to the Yakama Nation. The MOU addresses concerns expressed in the Yakama Nation's comments on the Draft SEIS (see Comment Letter 12), and provides a framework for developing a Traditional Cultural Resources Mitigation Plan with the Yakama Nation. Fourteen of the 30 archaeological sites recorded within the current Desert Claim Project Area are recommended significant and eligible for listing on historic registers. Of these 14 sites, 6 are prehistoric or ethnographic Native American sites, 7 are

historic, and 1 has dual historic/prehistoric components (although the significance of this site is based on its prehistoric component).

Significance of individual pre-contact and ethnohistoric Native American sites is considered in terms of their potential to address important research questions. The ability of a particular site to address research questions, and therefore be recommended significant and eligible for listing on historic registers, is a function of its artifact assemblage diversity and size as well as its potential to yield subsurface features and chronological data. To be considered significant, archaeological sites must also retain a level of physical integrity such that associations can be made between its contents, the site matrix, and the surrounding physical environment. Those associations are necessary to adequately address any research questions.

All of the Native American archaeological sites identified in the Project Area are entirely or almost entirely comprised of lithic artifacts. All contain the technological byproducts of chipped stone tool manufacture, and therefore may provide some data regarding stone tool technology. Sites that contain finished implements, both expedient flake tools and those involving a greater investment in time and materials, have the potential to address other research domains including subsistence and resource processing behavior and site chronology. However, sites with assemblages containing few artifacts, even if they represent several classes, are unlikely to provide *additional* information that can be used in a quantitatively meaningful way to address those research domains. Sites with artifact assemblages consisting of approximately 75 artifacts or more are therefore considered likely to yield additional information about local and regional Native American settlement, technology, and subsistence with further investigation. The sites that meet or exceed this assemblage size also contain at least three artifact classes. These sites also retain important aspects of their integrity, considering they are surface deposits without (or very unlikely to have) site stratigraphy that would have been substantially disturbed by historic and modern land use. Using these criteria, seven sites (45-KT-513 [prehistoric component], 45-KT-2413, 45-KT-2421, 45-KT-2787, 45-KT-2788, 45-KT-2789, and 45-KT-2910) are considered significant and recommended eligible to the NRHP.

The 19th- and 20th-century sites that may yield archaeological information about important aspects of the region's history, and are also associated with historically important events are those in which additional historical research provided associations between the physical remnants and records of specific homesteading, agricultural, or military activities (c.f., Hodges et al. 2003). The historic-period Desert Claim sites considered significant have the potential to yield additional information with further archaeological investigation, and may also complement existing historical documentation about the events with which they are associated. Historic sites considered significant require the same integrity of physical characteristics as Native American sites, allowing potential archaeological data from the site to be confidently linked to important

research questions, and/or must retain features, artifacts, and spatial relationships that convey important associations with events or persons (National Park Service 1990:46). Based on these criteria, seven sites (45-KT-2410, 45-KT-2411, 45-KT-2914, DC-03-25, DC-03-26, DC-03-28, and DC-03-31) are considered significant and recommended eligible to the National Register of Historic Places.

3.3.3 Significant Impacts

3.3.3.1 Desert Claim Proposal

Direct Impacts from Construction

The revised Desert Claim Project encompasses over 5,000 acres, with 95 proposed turbines and a network of supporting facilities and infrastructure, such as the electrical collection system, access roads, met towers, and switch yards. This impact analysis is based upon the configuration shown in Figure 2.2-2. However, as identified in the ASC, the Applicant intends to avoid significant archeological sites during final design and micro-siting where practical, and implement other mitigation measures when avoidance is not practical.

Thirty sites and 103 isolates were identified within the Project Area boundary during the three field surveys conducted between 2003 and 2008. Comparison of the locations of these sites and the Project layout as currently proposed indicates that 26 archaeological sites and isolates could be affected by construction disturbance if measures were not taken during final design and micro-siting to avoid them. Of these, five are sites considered significant. Direct impacts to sites and isolates were considered possible if their buffered boundary overlapped with the Project configuration as mapped at a 1:12,000 scale. Because of the buffering, no direct impacts were anticipated to sites and isolates whose boundaries touched but did not overlap the Project configuration.

The five significant pre-contact and historic sites potentially affected by the Desert Claim Project, based on locations where mapped construction elements intersect a 100-foot (30-meter) buffer zone around each resource, are identified as follows:

DC-03-26	Historic White Ranch Farmstead
45 KT 2413	Pre-Contact Lithic Scatter
45 KT 2421	Pre-Contact Lithic Scatter/Procurement Site
45 KT 2910	Pre-Contact Lithic Scatter
45 KT 2914	Ellensburg Auxiliary Airport

Proposed turbine locations are within the boundaries of four of the sites, and segments of access roads and electrical collection alignments ranging from 40 to 240 meters in length bisect all five sites.

If measures were not taken during final design and micro-siting to avoid impacts, Project construction elements would intersect with buffers for an additional 21 features, including archaeological and historic sites (with 100-foot/30-meter buffers applied) and archaeological isolated finds (50-foot/15-meter buffers) that are not considered significant. Three of these cases involve turbine locations, which intersect the buffers around an historic irrigation ditch (45-KT-2790), a lithic scatter and a single lithic flake, and another isolated find (a single lithic flake) is within the proposed northern switch yard location. The remainder of the non-significant sites and isolates are within the alignments of access roads and/or electrical collection system segments.

Indirect Impacts

In the general sense, potential indirect impacts from wind project development could include increased opportunities for removal of prehistoric or historic artifacts, particularly if development increased public accessibility to the area, and changes to the visual environment around cultural resource sites. As indicated in Section 3.1.3, the Desert Claim Final EIS concluded that significant impacts of this type were not anticipated. Development of the Desert Claim Project would not change the existing access conditions for the lands within the Project Area (most of which are privately owned). The visual environment around the cultural resource sites in the Project Area and vicinity currently exhibits substantial modification of the natural landscape.

3.3.3.2 No Action

As described in the Desert Claim Final EIS, under the No Action alternative, the proposed wind power facility would not be constructed and no project-related impacts to cultural resources would occur. However, past and current activities would continue to affect cultural resources. Natural processes such as surface erosion and weathering would continue. Likewise, agricultural activities would continue for the foreseeable future. Conversion of land for low-density rural residential uses could also occur in the future and could result in direct and indirect impacts to cultural resources.

3.3.4 Cumulative Impacts

In general, wind projects have avoided significant impacts to cultural resources by site planning and micro-siting of individual turbines and facilities, and mitigating unavoidable impacts through approved data recovery programs.

With the mitigation measures outlined below, no significant impacts to cultural resources are expected to occur as a result of the revised Desert Claim proposal. No impacts to cultural resources were identified for the Kittitas Valley Project (Final EIS 2005), the original Wild Horse Project or the proposed expansion to that project, or the Vantage Wind Power Project.

3.3.5 Mitigation Measures

Impacts to cultural resources could be avoided or mitigated in several ways, and the Applicant has agreed to implement mitigation. The Applicant has also agreed to conduct additional surveys of TCPs of importance to the Yakama Nation and to work with the Yakama Nation to prepare a Traditional Cultural Resources Mitigation Plan.

Avoiding all or most of the potential impacts to sites that have previously been identified as significant may be possible by micro-siting the wind turbines and other associated facilities during final project design to maintain a 100-foot (30-meter) buffer area around the recorded boundary of each significant archaeological or historical site. In some cases, a turbine could be moved a short distance, allowing straight-line road or transmission line connections between turbines to be moved away from archaeological resources. If a turbine is not within an archaeological site, the electrical or road connections could be re-routed around resources without moving the footprint of the turbine. If practical, the Applicant will also attempt to micro-site project facilities in order to avoid other sites that have been classified as significant.

For sites to be avoided in this manner, the boundaries of identified cultural resources (with suitable buffer zones) would need to be staked in the field and flagged as no-disturbance areas to avoid inadvertent entry and disturbance during construction. To preserve confidentiality of the resource locations, these site markings would be removed following construction. Given other siting constraints, it may not be possible to micro-site turbines and associated facilities in such a way that all archaeological and cultural resources are avoided. For example, the Project must observe safety-based setbacks of various distances from adjoining properties, homes, and public roads. The facility locations designated in the Project layout also reflect efforts to avoid wetlands, streams, and their buffer areas. Consequently, it may not be possible to avoid all impacts to archaeological and cultural resources without incurring offsetting impacts to other resources. In cases where final placement of project elements within the buffer areas of archaeological or cultural resources would be unavoidable, mitigation measures could be taken to retrieve the scientific and historical information that makes the resources significant. Other ways of mitigating adverse effects to archaeological or cultural resources can include (but are not limited to) maintaining or restoring the integrity of the site to the extent possible, relocating historic structures, and undertaking tribal consultation regarding treatment of cultural resources.

For archaeological sites that could not be avoided during the final design of the Project and micro-siting, mitigation would involve retaining a qualified cultural resource specialist to develop a cultural resource mitigation plan in consultation with the Yakama Nation and DAHP. This plan would include mitigation measures tailored to the specific circumstances of each resource and would be consistent with applicable federal, state, and local regulations. For the historic sites (such as the White Ranch and the Ellensburg Auxiliary Airport), it is possible that

nearby construction of specific project components would not damage archaeological features, or would impact them in such a way that their data potential was not compromised. In these cases, mitigation could involve additional research into the historic context of the resources and more detailed documentation of their physical remains.

To the extent that some impacts to archeological or cultural resources might be unavoidable, other available measures to mitigate impacts include the following:

- If project construction would unavoidably demolish or alter the setting and character of existing historic buildings and structures, those resources would be documented in accordance with Historic American Buildings Survey/Historic American Engineering Record guidelines and in consultation with DAHP prior to construction.
- In prior comments on the Desert Claim Wind Power Project Draft EIS (Kittitas County 2003), DAHP expressed concern that the Project could impact the setting or historic character of the surrounding landscape. The Applicant consulted with DAHP and volunteered to address this concern by documenting the current cultural landscape and developing a landscape history prior to construction. An MOA could be developed to specify the scope of such documentation and analysis to be completed prior to commencement of construction for the proposed Project.

Twenty-one isolated finds and archaeological sites not previously identified as significant would potentially undergo direct impacts during construction from the Desert Claim Project as proposed. These artifacts will be addressed in the Cultural Resources Mitigation Plan developed in consultation with DAHP and the Yakama Nation. It may not be necessary to avoid non-significant archaeological sites and isolates given the isolated nature of these finds and their low or non-existent data potential. However, management measures could be undertaken to protect these resources if possible. Because these resources lack important aspects of integrity, moving them out of the direct impact area would in all likelihood not damage them further. Such relocations should be limited to the shortest distance possible; in most cases, a move of up to 20 to 30 meters may be sufficient. Twelve of these 21 resources consist of non-diagnostic isolated lithic flakes or small scatters of lithic artifacts with limited archaeological data potential. These buffered areas should be examined through additional pedestrian survey prior to construction. In some cases it may not be feasible to relocate specific artifacts that were previously recorded. If artifacts can be relocated, the inventory forms should be updated to reflect the moves. Any additional associated artifacts found during the pre-construction pedestrian survey should be treated in the same manner. Another 7 of the 21 resources are isolated non-diagnostic historic artifacts or abandoned farm machinery. These items could be treated in a similar manner, by moving them away from construction zones and updating their inventory forms as appropriate. The other two resources, an historic irrigation ditch and a stock pond, cannot be moved.

Additional documentation of their physical characteristics in the specific areas of potential disturbance could be conducted prior to construction of the Project features that would affect these resources.

Regardless of the disposition with respect to other impacts and mitigation measures, an unanticipated discovery plan should also be developed for Project construction. This plan would provide a protocol for evaluation and treatment of any archaeological remains or human remains that might be discovered during construction.

3.3.5.1 Significant Unavoidable Adverse Impacts

Construction and operation of the Desert Claim Project could result in significant adverse direct and/or indirect impacts to cultural resources. As discussed above, however, the Applicant has proposed to implement mitigation measures that would reduce these impacts to a level of insignificance. These measures include avoidance of the impacts by relocating selected Project facilities or, if relocation is not practical, implementing approved data recovery programs. Therefore, with the mitigation identified, there would be no significant unavoidable adverse impacts to cultural resources from the Desert Claim Project.

3.4 AESTHETICS, LIGHT, AND GLARE

3.4.1 Summary of Prior Environmental Analysis

The Final EIS identified 19 viewpoints that were used to assess visual impacts of the Project. It generally concluded that long-term impacts associated with the original project proposal would vary with location and proximity to the Project. Four locations in the Northwest Valley Visual Assessment Unit (viewpoints 1A, 1E, 1F, and 1G), northwest of Ellensburg, were estimated to experience "High" levels of impacts. These views all had the foothills of the Wenatchee Mountains or Manastash Ridge as their background, had proposed turbines less than 1/4 mile away, and looked out over relatively flat terrain. As a result, the turbines' color contrasted with the colors of the foothills and sky, and the turbine size broke the skyline and was prominent in the view.

Under the original proposal, six locations in the Northwest Valley (viewpoints 1B and 1D), Greater Ellensburg (viewpoints 3C), Hayward Hill (viewpoint 6A), and Table Mountain Slope Visual Assessment Units (viewpoints 8A and 8B) would experience "Moderate" levels of impacts; these viewpoints were generally at higher elevations and located farther (1 to 4 miles) from the Project. At longer distances, there would be less perceived contrast in color between the turbines and background, and the turbines would occupy less of ones view; they would appear similar to power lines, fences, and other man-made objects in the foreground.

The remaining nine viewpoints were concluded to have "Low" levels of impact due to distance from the project and/or the presence of disrupting visual elements—particularly suburban development around Ellensburg—that are part of the existing visual environment.

3.4.2 Affected Environment

3.4.2.1 Methodology

The methodology used to evaluate visual impacts is described in detail in the Desert Claim Final EIS (Section 3.10 and Appendix G) and was used for this SEIS with a few changes discussed further below. In general, this approach entails several steps to identify, characterize and rank visual resources, and to assess the degree of impact. These steps are as follows:

1. Existing visual resources are categorized in discrete "landscape units," which are areas that share a common visual character and sense of place). Each landscape unit is documented and characterized using photographs. The existing conditions and visual character of each landscape unit is documented using a rating system (1, 2, or 3). Criteria used to characterize landscape units include their vividness, intactness, and unity; these terms are explained further in the Desert Claim Final EIS.

2. Viewpoints are identified to provide a focus for the analysis of visual impacts. The viewpoints were revised for the SEIS to reflect the new property configuration and turbine layout, as described further below.

3. For the viewpoints evaluated, a computer program is used to simulate (or visually superimpose) wind turbines on the existing landscape based on revised turbine dimensions and locations in the new proposed layout (see **Figure 2.2-1** and **2.2-2**). The simulations are intended to reflect what a viewer would observe from these viewpoints. All simulations have been updated to reflect the revised proposed layout.

4. The next step identifies and scores the degree of visual "exposure," characterizes the "sensitivity" of viewers, and assesses the overall quality of the existing view. Visual exposure refers primarily to the number of people who would see the turbine(s) from a particular viewpoint, but also considers the degree to which they are exposed to the view by their physical location and the duration of the view. Viewer sensitivity refers to how aware people are likely to be of the visual environment, which depends primarily on their typical activity. The scores are used by the analyst as a reference or short-hand for conclusions about visual exposure and viewer sensitivity; they are not used in a mathematical formula.

   The analysis assumes that while viewer groups often vary in the degree to which a visual impact is perceived, they do not often differ in their recognition of a project's visual

impact as positive or negative. The analysis is intended to focus on objective factors (such as vividness and intactness), and does not address viewer likes and dislikes.

It is noted that several recent studies of viewer perceptions indicate that the public seems to be embracing renewable energy solutions, such as wind power; this acceptance may also affect their visual perceptions. The British Wind Energy Association (BWEA), for example, has conducted more than 60 public perception surveys at or near wind power facilities since 1990. Support averaged 70 to 80 percent, both for wind energy in general and in the opinion of residents living near wind farms (www.bwea.com, BWEA Briefing Sheet: Public Attitudes to Wind Energy in the UK, October 2005). The surveys also indicated that pre-project concerns about visual and other environmental impacts declined significantly after the wind farm was in operation. (Also see American Wind Energy Association [AWEA], Wind Energy: Views on the Environment: Clean and Green).

5. The overall level of change or impact caused by the project is measured by the degree of change that occurs between the existing view and the view with the project. A number is used to indicate the analyst's assessment of the degree of change; a decrease of .33 equates to a low impact, a decrease of .67 equates to a medium impact, and a decrease of 1.0 equates to a high impact. The assessment is conservative in that the visibility of even a single turbine at any distance is presumed to have at least a low impact. The conclusions are discussed in narrative and summarized in a table.

This general approach was used in the Desert Claim Final EIS and in this SEIS. Two modifications are reflected in the SEIS:

(1) Thirteen new viewpoints, described in the following subsection, were identified and used in the analysis to reflect the revised property configuration, the new turbine layout, and the new proposed turbine height. Some viewpoints used in the Final EIS were eliminated for reasons described in the following section. Twenty-five viewpoints were evaluated in the SEIS, compared to nineteen in the Final EIS;

(2) A 50 mm lens was used to photograph the existing landscape and to prepare the simulations, rather than the 35mm lens used in the Desert Claim Final EIS. The change in camera focal length is in response to recommendations by EFSEC's consultant. A 50mm lens generally corresponds to the normal field of view of a typical viewer looking straight ahead, and is most frequently used in landscape analysis. In comparison, a 35mm lens shows more of the surrounding landscape but makes objects appear to be further away compared to a 50mm lens. (The camera used for the analysis was a Canon EOS Digital Rebel XTi, which has a 1.6 digital crop ratio, with a Canon EFS 18-55mm lens.)

In cases where a viewpoint used in the present analysis (50mm lens) was also used in the Final EIS analysis (35mm lens), the findings were reassessed to determine whether the change in camera focal length (as distinct from change in turbine configuration) had an effect on impact ratings. Examples of the same view using a 35mm and 50mm lens are shown in **Figures 3.4-1** and **3.4-2**. As described in Section 3.4.3, the change in camera lens was not found to have a material influence on the ratings.

3.4.2.2 Viewpoints

The viewpoints used for the visual analysis were revised to reflect changes in the Project Area and turbine layout. The Project Area has generally shifted to the west and slightly to the north, compared to the Final EIS proposal (**Figure 3.4-3**). The easternmost parcels in the Final EIS proposal have been eliminated, and the property is now contiguous. New property has been added to the west (WDNR and private property owners), which is sparsely populated, has fewer residences, and is generally further away from Ellensburg and its concentration of population. The revised property configuration and reduced number of turbines have reduced turbine density from 1:43 acres to 1:55 acres. In view of these changes, some viewpoints used in the Desert Claim Final EIS were no longer used, either because no turbines would be visible with the new layout; the viewpoint was not considered representative of how nearby residents and other viewer groups would experience the project; or elements in the foreground (such as topography or recent construction) now blocked the view of turbines. As a result, thirteen new viewpoints (shown on **Figure 3.4-4**) were identified and used for the SEIS analysis; five of these are oriented to the western portion of the Project Area.

Figure 3.4-1. Viewpoint 1B – Existing View with 35mm Lens (above) and 50mm Lens (below)
Note that the utility pole in the middle-ground appears closer and larger with the 50mm lens.

Figure 3.4-2. Viewpoint 3C – Existing View with 35mm Lens (above) and 50mm Lens (below)
Note that green water tower in background (right side) appears larger with 50mm lens.

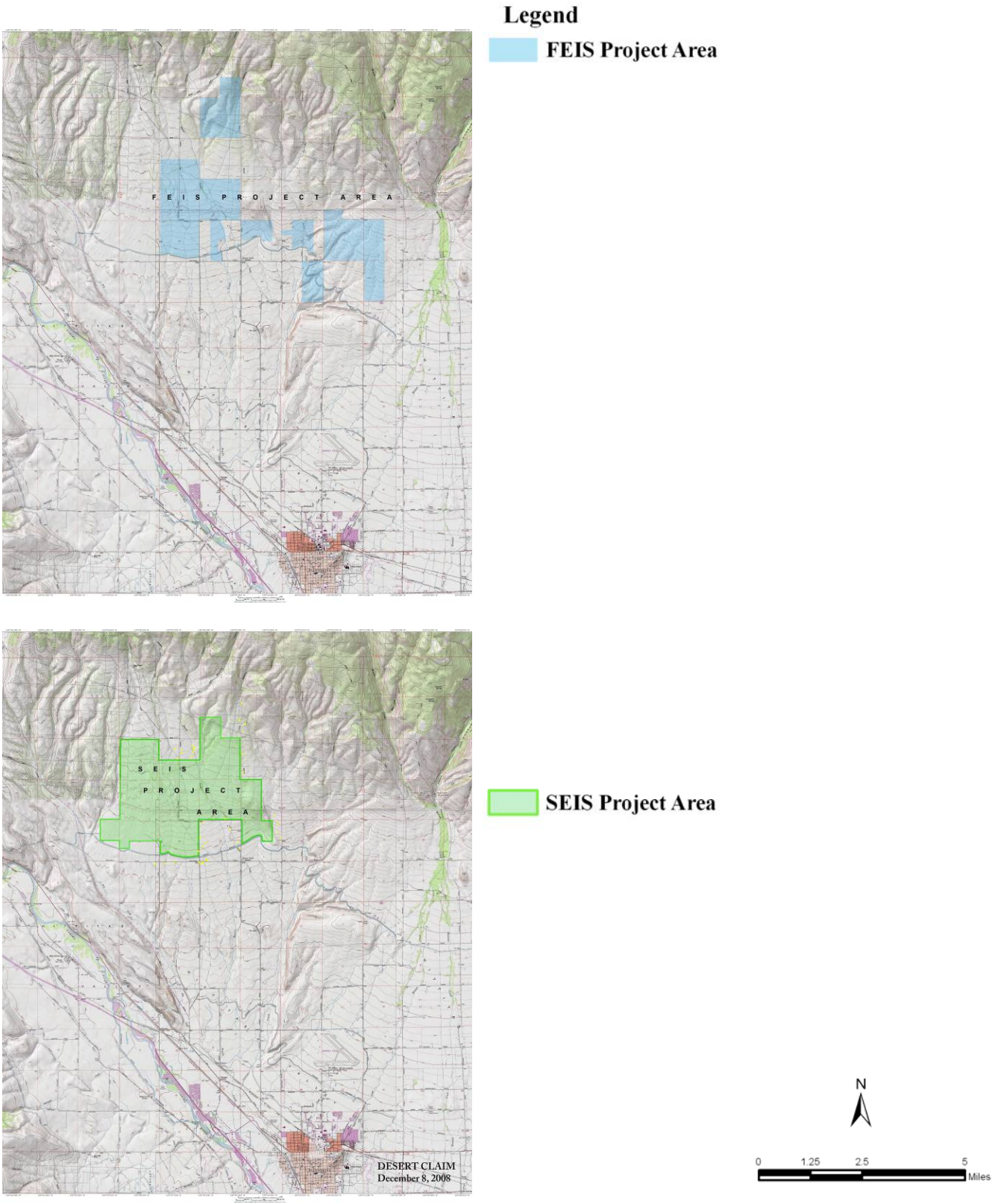


Figure 3.4-3. Final EIS and SEIS Project Areas

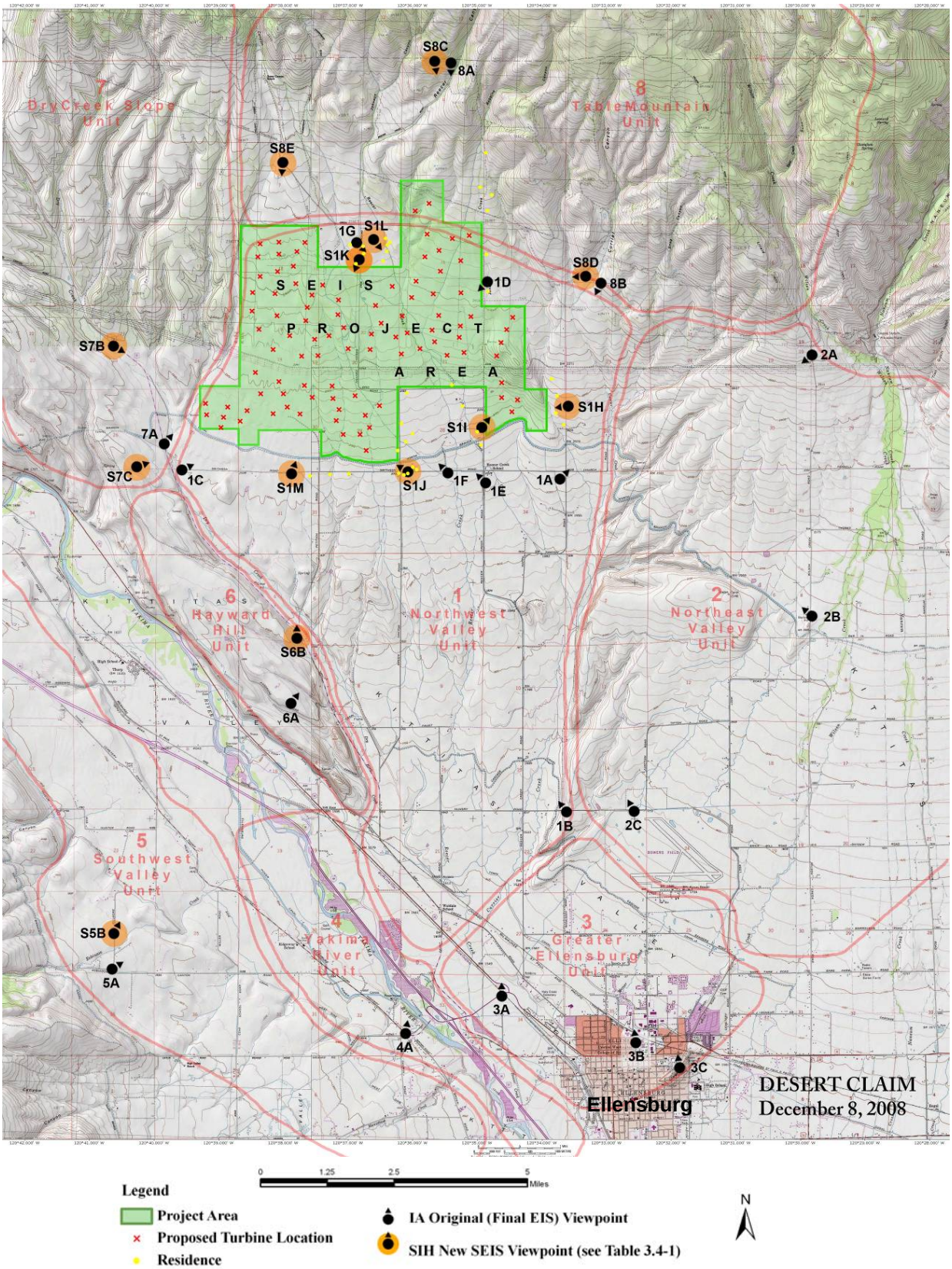


Figure 3.4-4. Project Area and Viewpoints

3.4.3 Significant Impacts

3.4.3.1 Desert Claim Proposal

Input Methods

Photosimulations

"Before" and simulated "after" photos of viewpoints are used to show the landscape as it currently exists and with proposed wind turbines. The photos are used to assist in the evaluation of impacts and to depict the changes that would occur to the visual environment. Computer-generated photosimulations, which electronically superimpose proposed wind turbines on the landscape, were created for each of the identified viewpoints. The before and after photos for each viewpoint are presented at the end of this section (**Figures 3.4-5** through **3.4-49**).

Factors Influencing Degree of Impact

Using the methodology described in Section 3.4.2, visual quality was assessed and scored for each viewpoint, and impacts were rated as High, Moderate, or Low. The impact to each viewpoint is discussed in the following subsection. Major factors influencing the assessment are described below.

The height of the turbines was determined to be the major component affecting long-term visual impacts, and impacts generally decrease with increasing distance. Other components of the project including roads, O&M center, substation, met towers, and others described in Chapter 2 of the SEIS, are much smaller, would be visible only from the immediate surrounding area, and would be designed to blend in with their surroundings. As a result, they would have a minor impact on the visual environment

The primary changes to the revised Desert Claim Project affecting visual quality are the reduction in the number of turbines, from 120 to 95; the decrease in turbine density, from 1 turbine per 43 acres to 1 turbine per 55 acres; the contiguous Project Area, which has also shifted to the west and north, farther away from Ellensburg; a reduction in the number of turbines required to be lit at night and the elimination of daytime flashing strobe lights; and the increase in the distance between turbines and adjacent residences, from a minimum of 1,000 feet to at least 1,640 feet for residences located outside the Project Area.

A separation of 1,640 feet (four times the turbine tip height) has been used as a guide for Desert Claim's revised turbine configuration. Increasing distances further may be possible through individual turbine micrositing for turbines located within 2,500 feet of residences. At a viewing distance of four times its height, an object blends in more with its surroundings, and does not dominate a view. Examples of the literature supporting this distance are summarized below.

(Note that pre-filed testimony, Exhibit 18, also contains an analysis of the mitigating effect of increased distance from large objects.)

For centuries, architects, designers, and optical theorists have considered the appropriate spacing of tall structures. In the 1400s, Alberti wrote that to avoid buildings feeling too high, buildings around a square should be a maximum of one-third the breadth of the open area (Alberti, Leone Batista, The Ten Books of Architecture, Book 8, Chapter 6, p. 173.). In 1570, Palladio similarly concluded that a harmonious relationship between spaces is established if structures built around a square are not taller than a third of the width of the square (Palladio, Andrea. The Four Books of Architecture, Book 1, Chapter 16, p. 193.).

More recently, in 1953 Hans Blumenfeld cited the work of H. Maertens (The Optical Scale in the Plastic Arts 1884) who related the mathematics for the measurement of optics to architectural scale and building design. Blumenfeld explains Maertens' work as follows:

> the maximum angle at which an object can be perceived clearly and easily, is about 27 degrees, corresponding to a ratio of 1:2 between the size of the object and its distance from the beholder....At an angle of 27 degrees...the object appears...'as a little world in itself' with the surroundings only dimly perceived as a background; at an angle of 18 degrees (1:3) it still dominates the picture, but now its relation to its surroundings becomes equally important. At angles of 12 degrees (1:4) or less, the object becomes part of its surroundings and speaks mainly through its silhouette (Blumenfeld, Hans. Scale in Civic Design, in Town Planning Review, Vol 24, April 1953, pp. 36, 37).

In 1973, a planning document developed for the County of Essex, England, stated as follows: "The relationship between the 'effective height' of the buildings and the width of the space is critical if a harmonious [spatial relationship] is to be created. If too high in relation to width, a feeling of oppression may result." The guide goes on to suggest that a 1:4 proportion of height to width creates a harmonious spatial relationship (County Council of Essex, 1973, p. 65.).

While the works cited deal primarily with larger buildings that have more mass than a wind turbine, the optical and psychological principles can also be applied to most types of environmental design. A wind turbine is, of course, much narrower than the buildings considered in these references, so at a viewing distance of four times its height, it blends in with its surroundings, and generally no longer dominates a view; a viewer does not have to physically move his/her head upward to see all of the object. By increasing the distance between turbines and residences to more than four times the tip height of the turbine, therefore, the revised proposal has significantly reduced visual impacts.

Impacts to Visual Assessment Units

This subsection describes the visual impact evaluation for the revised Desert Claim proposal, which is summarized in **Table 3.4-1**. The discussion includes new viewpoints selected for the SEIS, along with viewpoints used in the Final EIS that are still relevant to the revised proposal. Final EIS viewpoints that were no longer considered representative are not discussed. For each assessment unit, primary viewer exposure and sensitivity are characterized, followed by an assessment of existing visual quality. Then, visual quality with the project and the resulting level of impact are described. Viewpoints that are identified with an "S" (e.g., S1H or S5B) are new viewpoints used in the SEIS. Please refer to the Desert Claim Final EIS (Appendix G) for more detailed information about how ratings were derived.

Table 3.4-1. Summary of Impacts by Visual Assessment Unit and Viewpoint

Key View	Primary Viewer Exposure	Primary Viewer Sensitivity	Existing Visual Quality	With Project Visual Quality	Level of Visual Impact
Unit 1: Northwest Valley Floor					
1B	2	2	3.0	2.33	Moderate
1C	2	2	2.0	1.33	Moderate
1D	2	3	2.0	1.33	Moderate
S1H replaces 1A	2	3	2.33	1.33	High
S1I replaces 1E	2	3	2.67	1.33	High
S1J replaces 1F	2	3	2.0	1.33	Moderate
S1K replaces 1G	1	3	2.0	1.0	High
S1L	2	3	2.0	1.0	High
S1M	2	3	2.33	1.67	Moderate
Unit 2: Northeast Valley Floor					
2A	2	3	1.67	1.67	None–Turbines no longer visible
2B	1	2	2.0	1.67	Low
2C	2	2	2.67	2.33	Low
Unit 3: Greater Ellensburg					
3A	2	2	1.33	1.00	Low
3B	1	1	1.33	1.33	None-Turbines no longer visible
3C	1	2	2.67	2.0	Moderate
Unit 4: Yakima River					
4A	1	2	3.0	3.0	None-Turbines no longer visible
Unit 5: Southwest Valley Floor					
S5B replaces 5A	1	2	2.33	2.00	Low
Unit 6: Hayward Hill					
6A	1	3	3.0	2.67	Low

Table 3.4-1. Summary of Impacts by Visual Assessment Unit and Viewpoint (continued)

Key View	Primary Viewer Exposure	Primary Viewer Sensitivity	Existing Visual Quality	With Project Visual Quality	Level of Visual Impact
S6B	1	3	2.0	1.33	Moderate
Unit 7: Dry Creek Slope					
7A	2	1	2.33	1.67	Moderate
S7B	2	1	2.0	1.33	Moderate
S7C	1	3	2.67	2.0	Moderate
Unit 8: Table Mountain Slope					
S8C replaces 8A	1	3	2.67	2.0	Moderate
S8D replaces 8B	3	3	2.33	1.67	Moderate
S8E	2	3	2.33	1.67	Moderate

The Final EIS discussed the existing visual quality of many of the viewpoints. The following subsection addresses only the viewpoints that are new to the SEIS or that have experienced changes in visual quality since the Final EIS was written.

Visual Assessment Unit 1: Northwest Valley

Viewer Group Exposure and Visual Sensitivity

Primary Viewer Groups	Viewer Exposure	Viewer Sensitivity
Rural residents	Moderate	High
Agricultural workers	Moderate	Low
Motorists on Reecer Creek Rd.	Moderate	Moderate
Motorists on County roads	Low	Moderate
John Wayne Trail Users	Low	Moderate

Existing Visual Quality

View S1H: **Figure 3.4-11** shows an existing view looking west-by-southwest across the Northwest Valley Visual Assessment Unit from Robbins Road, just north of the North Branch Canal. (Note: This viewpoint was considered more relevant than Final EIS Viewpoint 1A, which was oriented toward an area that is no longer part of the Project Area.)

Vividness—2: Regional representation of agricultural land and open space that includes, farm pastures and structures, broad open valley floor, foothills and mountains beyond. Hillside in middleground on right side rises dramatically and blocks view of distant mountains.

Intactness—2: Strong visual character that is mostly free from encroachment of discordant elements, with the exception of a few distant powerline poles.

Unity—3: Unified and coherent visual composition.

Overall Visual Quality: 2.33—Moderate.

View S1I: **Figure 3.4-13** shows an existing view looking northeast across the Northwest Valley Visual Assessment Unit from Reecer Creek Road, immediately north of North Branch Canal. This viewpoint was selected as being more relevant than Viewpoint 1E because the original viewpoint was oriented toward an area where turbines are no longer being proposed (although more distant turbines would still be visible).

Vividness—2: Unobstructed view of rolling pastureland ascending to more steeply rising foothills beyond. Grassland punctuated by sparsely scattered shrub steppe vegetation, with upland forest beginning to appear in higher elevations. Somewhat memorable and picturesque.

Intactness—3: Intact example of Kittitas Valley pastureland with natural foothills beyond.

Unity—3: Unified and coherent visual patterns of rural farmland and natural foothill environments.

Overall Visual Quality: 2.67—High.

View S1J: **Figure 3.4-15** shows an existing view looking west-by-northwest across the Northwest Valley Visual Assessment Unit from Smithson Road, just east of Green Canyon Road. This viewpoint was selected as being more relevant than Viewpoint 1F, because the original viewpoint was oriented toward an area where turbines are no longer being proposed (although more distant turbines would still be visible).

Vividness—2: Foreground view of enclosed pasture surrounded by a variety of wetland, riparian, and shrub steppe vegetation. Distant views of Wenatchee Mountains foothills and powerline transmission towers.

Intactness—2: Distant powerline transmission towers, and utility poles in the foreground disrupt the pastoral character of the view.

Unity—2: The scattered appearance of a variety of fence post types, utility poles, and distant powerline towers break up what would otherwise be a fairly unified pastoral composition.

Overall Visual Quality: 2.00—Moderate.

View S1K: **Figure 3.4-17** shows an existing view looking south-by-southwest across the Northwest Valley Visual Assessment Unit from Reecer Creek Road, just north of the project boundary. This viewpoint was selected as being more relevant and representative than

Viewpoint 1G, because it is oriented toward turbines that are closer to nearby residences in the current SEIS proposal.

Vividness—2: View across the valley floor to foothills and the Manastash Ridge in the distance are picturesque but fairly typical. The contrasting patterns of shrub steppe vegetation, pastureland, distant powerlines, and dramatically rising foothills add depth and interest to the scene.

Intactness—2: Distant powerline transmission towers, utility poles, and light reflected from roofs on opposite side of the valley disrupt the intactness of the view.

Unity—2: The variety of powerline transmission towers, utility poles and fencing elements detract from the unity of the visual patterns.

Overall Visual Quality: 2.00—Moderate.

View S1L: **Figure 3.4-19** shows an existing view looking southeast across the Northwest Valley Visual Assessment Unit from 1/8 mile east of Reecer Creek Road, 1/8 mile north of the Project boundary. This viewpoint was selected as being relevant because it shows a group of existing farms/residences that would be near proposed turbines.

Vividness—2: View across the valley floor to foothills and the Manastash Ridge in the distance are picturesque but fairly typical. The contrasting patterns of farm buildings and poplar windbreaks, shrub steppe vegetation, pastureland, distant powerlines, and dramatically rising foothills add depth and interest to the scene.

Intactness—2: Distant powerline transmission towers, utility poles, and light reflected from roofs of farm structures and residences disrupt the intactness of the view.

Unity—2: The variety of farm buildings and residences, powerline transmission towers, utility poles, and fencing elements detract from the unity of the visual patterns.

Overall Visual Quality: 2.00—Moderate.

View S1M: **Figure 3.4-21** shows an existing view looking north-by-northeast across the Northwest Valley Visual Assessment Unit from Smithson Road, 1/4 mile west of Howard Road. This viewpoint was selected because it provides a representative view of the area where turbines are being proposed on the WDNR and private parcels added to the revised proposal.

Vividness—3: Unobstructed view of rolling pastureland ascending to more steeply rising foothills beyond. Grassland punctuated by sparsely scattered shrub steppe vegetation, distant powerlines, and farm structures, with upland forest beginning to appear in higher elevations. Somewhat memorable and picturesque.

Intactness—2: Distant powerline transmission towers and utility poles disrupt the intactness of the view.

Unity—2: The variety of powerline transmission towers, utility poles, and fencing elements detract from the unity of the visual patterns.

Overall Visual Quality: 2.33—Moderate.

Visual Assessment Unit 5: Southwest Valley

Viewer Group Exposure and Visual Sensitivity

Primary Viewer Groups	Viewer Exposure	Viewer Sensitivity
Rural residents	Low	Moderate
Agricultural workers	Low	Low
Motorists on County roads	Low	Moderate

Existing Visual Quality

View S5B: **Figure 3.4-32** shows an existing view looking north-by-northeast from the Southwest Valley Visual Assessment Unit approximately 1/2 mile north of the intersection of Killmore Road and Robinson Road. This viewpoint was selected as being more relevant than Viewpoint 5A because a recent housing development has blocked views of most of the wind farm Project Area.

Vividness—3: Memorable regional representation of agricultural land and open space that includes farm pastures and structures, broad open valley floor, foothills, and mountains.

Intactness—2: Strong visual character that is relatively free from encroachment of discordant elements, although wind turbines detract slightly from overall intactness.

Unity—2: Slight reduction in compositional harmony due to highly contrasting styles and scales of expression of farmland built elements.

Overall Visual Quality: 2.33—Moderate.

Visual Assessment Unit 6: Hayward Hill

Viewer Group Exposure and Visual Sensitivity

Primary Viewer Groups	Viewer Exposure	Viewer Sensitivity
Rural residents	Low	High
Motorists on County roads	Low	Moderate

Existing Visual Quality

View S6B: **Figure 3.4-36** shows an existing view looking north from the Hayward Hill Visual Assessment Unit near a group of residences immediately south of U.S. Highway 97, above the intersection with Howard Road. This viewpoint was added because it shows the area where the Project Area has expanded farther to the south and west from the Final EIS Project Area, and it shows the area where turbines may be more visible to motorists along U.S. Highway 97 and residences in the area.

Vividness—2: Somewhat memorable view across agricultural land and open space that includes farm pastures and structures, residences, riparian areas, broad open valley floor, and foothills.

Intactness—2: Strong visual character that is somewhat compromised by the presence of utility poles, traffic signs, and other roadside elements associated with U.S. Highway 97.

Unity—2: Slight reduction in compositional harmony due to highly contrasting styles and scales of expression of farmland built elements, the presence of U.S. Highway 97, and associated roadside objects.

Overall Visual Quality: 2.00—Moderate.

Visual Assessment Unit 7: Dry Creek Slope

Viewer Group Exposure and Visual Sensitivity

Primary Viewer Groups	Viewer Exposure	Viewer Sensitivity
Rural residents	Low	High
Motorists on Hwy 97.	Moderate	Low

Existing Visual Quality

View S7B: **Figure 3.4-40** shows an existing view looking southeast from U.S. Highway 97 in the Dry Creek Visual Assessment Unit approximately 1½ miles north of the intersection of Smithson Road at driveway 16011. This viewpoint was selected because it represents the only view that southbound motorists on U.S. Highway 97 will have of the proposed wind turbines.

Vividness—2: Somewhat memorable view that includes dramatic ridgelines, and some views to the foothills and mountains beyond. The ridgeline blocks views of the open Kittitas Valley floor.

Intactness—2: Roadside elements and utility poles detract from the visual quality.

Unity—2: Scale of roadway and utility poles contrasts with and dominate the overall landscape character.

Overall Visual Quality: 2.00—Moderate.

View S7C: **Figure 3.4-42** shows an existing view looking north-by-northeast from the Dry Creek Slope Visual Assessment Unit approximately 1/2 mile west of U.S. Highway 97 above the terminus of Smithson Road. This viewpoint is representative of a group of farms that sit on the hill to the west of the Project Area. Though roughly a mile from the nearest turbine, the site has a good vantage point from which to view most of the Project Area.

Vividness—3: Memorable regional representation of agricultural land and open space that includes farm pastures and structures, broad open valley floor, and foothills in the distance.

Intactness—3: Strong visual character that is relatively free from encroachment of discordant elements, although power transmission poles are visible in the distance.

Unity—2: Slight reduction in compositional harmony due to presence of powerline transmission towers and contrasting styles and scales of expression of farmland built elements.

Overall Visual Quality: 2.67—High.

Visual Assessment Unit 8: Table Mountain Slope

Viewer Group Exposure and Visual Sensitivity

Primary Viewer Groups	Viewer Exposure	Viewer Sensitivity
Rural residents	Moderate	High
Outdoor recreationists	Low	High

Existing Visual Quality

View S8C: **Figure 3.4-44** shows an existing view looking south from the Table Mountain Slope Visual Assessment Unit over the Kittitas Basin. This view is more relevant than View 8A because elements in the foreground blocked view of part of the current turbine layout.

Vividness—3: Memorable display of the open sky, mountains, valley floor; dramatic changes in topography from vantage point. Diverse plant communities: ponderosa pine forest, riparian vegetation, shrub-steppe, rangeland, and pasture. Farms dot the valley floor.

Intactness—3: Strong visual character. Undisrupted skyform, landcover, landform, and built forms.

Unity—2: Clear visual composition and sense of prospect and refuge; moderately harmonious patterns across the valley.

Overall Visual Quality: 2.67—High.

View S8D: **Figure 3.4-46** shows an existing view looking west from the Sun East development in the Table Mountain Slope Visual Assessment unit along Robbins Road. This viewpoint is more relevant than viewpoint 8B because it was oriented mainly toward an area where turbines are no longer being proposed.

Vividness—3: View across the valley to Manastash Ridge allows an appreciation of the larger form of the valley as well as its distinctive rolling landforms and a diverse array of native shrub steppe vegetation. The top of Mount Rainier is visible among the clouds behind the mountains.

Intactness—2: View over stunning valley interrupted by utility poles, fence rows, and scattered residential structures.

Unity—2: Clear, uninterrupted progression from foreground through background along undulating landforms. Powerlines and utility poles break up visual patterns.

Overall Visual Quality: 2.33—Moderate.

View S8E: **Figure 3.4-48** shows an existing view looking south from the Table Mountain Slope Visual Assessment Unit toward the WDNR property from Upper Green Canyon Road. This view is a new view selected because it provides a clear view of the WDNR property (which was not part of the Final EIS Project Area) where no turbines were previously proposed.

Vividness—2: Somewhat memorable view of vast, undulating topography that changes color and texture as it rolls from dry desert steppe to the greener Yakima River valley bottom in the distance. Farms, associated structures, utility poles, and towers form repeating patterns that fade into the distance.

Intactness—3: Strong visual character. Undisrupted repeating patterns of sparse vegetation on rolling hills, with occasional farm structures and outlines of pastures.

Unity—2: Clear visual composition and balanced integration of built and natural elements in a harmonious pattern; broken up slightly by powerlines and utility poles.

Overall Visual Quality: 2.33—Moderate.

Impacts with the Revised Desert Claim Project

Visual Assessment Unit 1: Northwest Valley

Visual Quality of Views-With Project

View S1H: **Figure 3.4-12** shows a simulated view looking west-by-southwest across the Northwest Valley Visual Assessment Unit from Robbins Road, just north of the North Branch Canal.

Vividness—2: Height and concentration of turbines create a vivid scene, but they detract from the open, expansiveness of the agricultural open space and views of the mountains beyond. The superior position of the tower on the right side adds to its height.

Intactness—1: The intactness of the view is severely diminished by the introduction of the discordant turbines.

Unity—1: The strong vertical character of the turbines contrasts sharply with the horizontally oriented visual characteristics of the agricultural landscape and the hills and ridgelines beyond.

Overall Visual Quality: 1.33—Low.

Level of Visual Impact: 1.00—High.

View S1I: **Figure 3.4-14** shows a simulated view looking northeast across the Northwest Valley Visual Assessment Unit from Reecer Creek Road, immediately north of North Branch Canal.

Vividness—1: Height and light color of turbines impact the qualities of the pastureland and foothills beyond.

Intactness—2: The presence of the turbines, in an otherwise intact landscape, creates a contrast to their surroundings.

Unity—1: The strong horizontal characteristic of the progression from foreground to background is disrupted by the turbines.

Overall Visual Quality: 1.33—Moderate.

Level of Visual Impact: 1.34—High.

View S1J: **Figure 3.4-16** shows a simulated view looking west-by-northwest across the Northwest Valley Visual Assessment Unit from Smithson Road, just east of Green Canyon Road.

Vividness—1: Height and density of turbines diminish the intrinsic features of the foreground pastureland and distant mountains.

Intactness—2: Although the turbines disrupt the skyline and pastoral qualities of the view, the view was already disrupted by exiting transmission towers and utility poles.

Unity—1: The turbines add additional discordant elements to the view and detract from the expansiveness of the distant view.

Overall Visual Quality: 1.33—Low.

Level of Visual Impact: .66—Moderate.

View S1K: **Figure 3.4-18** shows a simulated view looking south-by-southwest across the Northwest Valley Visual Assessment Unit from Reecer Creek Road, just north of the project boundary.

Vividness—1: Large scale and quantity of turbines detract from the intrinsic qualities and features of the long, cross-valley view.

Intactness—1: Turbines break up the view of the Manastash Ridge and foothills in the distance, and decrease the openness of the middleground pastureland.

Unity—1: The turbines appear as a large scattered group, encompassing the entire scene and disrupting the strong horizontal character of the landscape.

Overall Visual Quality: 1.00—Low.

Level of Visual Impact: 1.00—High.

View S1L: **Figure 3.4-20** shows a simulated view looking south east across the Northwest Valley Visual Assessment Unit from 1/8 mile east of Reecer Creek Road, 1/8 mile north of the Project boundary.

Vividness—1: Somewhat memorable view—large scale and quantity of turbines detract from the intrinsic qualities and features of the long, cross-valley view.

Intactness—1: Turbines break up the view of the Manastash Ridge and foothills in the distance, and decrease the openness of the middleground pastureland.

Unity—1: The turbines appear as a large scattered group, encompassing the entire scene and disrupting the strong horizontal character of the landscape.

Overall Visual Quality: 1.00—Low.

Level of Visual Impact: 1.00—High.

View S1M: **Figure 3.4-22** shows a simulated view looking north-by-northeast across the Northwest Valley Visual Assessment Unit from Smithson Road, 1/4 mile west of Howard Road.

Vividness—2: Large scale and quantity of turbines detract moderately from rolling pastureland and foothills beyond. Ridge in background still dominates scale of turbines.

Intactness—2: Although turbines and existing powerline transmission towers break up views of foothills in the distance, and decrease the openness of the middleground pastureland, the intactness of views was already disrupted by existing utility towers and utility poles.

Unity—1: The turbines and existing powerline transmission towers detract from the unity of the visual patterns in the landscape.

Overall Visual Quality: 1.67—Moderate.

Level of Visual Impact: 0.66—Moderate.

Visual Assessment Unit 5: Southwest Valley

Visual Quality of Views-With Project

View S5B: **Figure 3.4-33** shows a simulated view looking north-by-northeast from the Southwest Valley Visual Assessment Unit approximately 1/2 mile north of the intersection of Killmore Road and Robinson Road.

Vividness—3: No significant change in vividness; the turbines are not strong features at this distance.

Intactness—2: Turbines do not break up the skyline or views of the distant hills. They do contrast slightly with the brown foothills, but not enough to change the existing intactness rating.

Unity—1: Although they are distant, the wind farm introduces elements and patterns that are not part of the existing farmland view.

Overall Visual Quality: 2.00—Moderate.

Level of Visual Impact: 0.33—Low.

Visual Assessment Unit 6: Hayward Hill

Visual Quality of Views-With Project

View S6B: **Figure and 3.4-37** shows a simulated view looking north from the Hayward Hill Visual Assessment Unit near a group of residences immediately south of U.S. Highway 97, above the intersection with Howard Road.

Vividness—2: Somewhat ”memorable” view across agricultural land and open space that includes proposed turbines, farm pastures and structures, residences, riparian areas, broad open valley floor, and foothills. Distant hills dominate proposed wind turbines, farm elements, and residences.

Intactness—1: The intactness of the view is diminished by the introduction of a large number of wind turbines.

Unity—1: The strong vertical character of the turbines contrasts sharply with the horizontally oriented visual characteristics of the agricultural landscape, hills, and ridgelines beyond.

Overall Visual Quality: 1.33—Low.

Level of Visual Impact: 0.67—Moderate.

Visual Assessment Unit 7: Dry Creek Slope

Visual Quality of Views-With Project

View S7B: **Figure 3.4-41** shows a simulated view looking southeast from Highway 97 in the Dry Creek Visual Assessment Unit approximately 1½ miles north of the intersection of Smithson Road at driveway 16011.

Vividness—2: Height and contrast of the turbines create a vivid scene. Although they detract somewhat from the rural/agricultural character of the landscape and from the views of the mountains beyond, the view remains in the moderate range of vividness.

Intactness—1: The intactness of the view is diminished by the introduction of the turbines.

Unity—1: The strong vertical character of the turbines contrasts sharply with the horizontally oriented visual characteristics of the agricultural landscape and the hills and ridgelines beyond.

Overall Visual Quality: 1.33—Low.

Level of Visual Impact: 0.67—Moderate.

View S7C: **Figure 3.4-43** shows a simulated view looking north-by-northeast from the Dry Creek Slope Visual Assessment Unit approximately 1/2 mile west of U.S. Highway 97, above the terminus of Smithson Road.

Vividness—3: Memorable view disrupted slightly by presence of distant turbines.

Intactness—2: Turbines encroach slightly on strong visual character of agricultural landscape.

Unity—1: The turbines contrast with the lines and forms of the existing agricultural landscape and introduce a new element to the view.

Overall Visual Quality: 2.00—Moderate.

Level of Visual Impact: 0.67—Moderate.

Visual Assessment Unit 8: Table Mountain Slope

Visual Quality of Views-With Project

View S8C: **Figure 3.4-45** shows a simulated view looking south from the Table Mountain Slope Visual Assessment Unit over the Kittitas Basin.

Vividness—2: Turbines only moderately diminish appreciation of the open expansiveness of the valley floor and the distant views.

Intactness—2: The leftmost turbine intrudes on the view; the majority of the turbines, however, blend to some degree with the mixture of tones and textures in the valley floor.

Unity—2: Although scattered turbine arrangement clutters middleground and contrasts somewhat with the strong horizontal character of the vegetation and pasture patterns, the view remains in the moderate range for unity.

Overall Visual Quality: 2.00—Moderate.

Level of Visual Impact: 0.67—Moderate.

View S8D: **Figure 3.4-47** shows a simulated view looking west from the Sun East development in the Table Mountain Slope Visual Assessment unit along Robbins Road.

Vividness—2: Scattered pattern of turbines diminish appreciation the larger form of the valley and of Mt. Rainier, but overall experience of the valley is still dominant.

Intactness—2: Turbines slightly detract from valley view that is already interrupted by utility poles and other elements.

Unity—1: Scattered turbine arrangement clutters middle- and background, and contrasts with the strong horizontal character of the vegetation and pasture patterns.

Overall Visual Quality: 1.67—Moderate.

Level of Visual Impact: 0.66—Moderate.

View S8E: **Figure 3.4-49** shows a simulated view looking south from the Table Mountain Slope Visual Assessment Unit toward the WDNR-managed property from Upper Green Canyon Road. This view is a new view selected because it provides a clear view of the WDNR-managed property (which was not part of the Final EIS Project Area) where no turbines were previously proposed.

Vividness—2: Turbines diminish appreciation of the distant view and rolling topography, but the view remains in the moderate range for vividness.

Intactness—2: Turbines interrupt the patterns of vegetation, farm structures, and outlines of pastures.

Unity—1: Scattered turbines clutter middleground and break harmonious patterns of built and natural elements.

Overall Visual Quality: 1.67—Moderate.

Level of Visual Impact: 0.66—Moderate.

Summary and Conclusions

Of the seven original viewpoints in the Final EIS within the Northwest Valley Visual Assessment Unit (1A through 1G), the four viewpoints that were rated High for level of visual impact in the Final EIS (1A, 1E, 1F, and 1G) dropped to ratings of Moderate, Low, or None with the SEIS proposal because the project layout essentially moved away from them or out of view. The only viewpoint where the level of visual impact increased with the SEIS project layout was viewpoint 1C. The visual impact for viewpoint 1C was rated Low in the Final EIS analysis since the nearest turbine was almost 2 miles away, but it was changed to Moderate in the SEIS analysis because the new project layout now has turbines located just over 1/2 mile from the viewpoint.

Of the six new viewpoints studied in the SEIS in the Northwest Valley Unit (viewpoints S1H through S1M), four were rated High and two were rated Moderate. Four of these new viewpoints (S1H through S1K) were selected to represent the residences closest to multiple turbines. Two other new viewpoints (S1L and S1M) were added because they were near groups of farms or residences that would be potentially impacted by the SEIS project layout.

From the visual assessment units that surround the Northwest Valley Unit, wind turbines would also be visible, to varying degrees, but in these cases views of the turbines would be from much greater distances and the levels of visual impact would be Moderate to Low. At viewpoints in the other seven visual assessment units that were reassessed, the visual impact ratings for four of the viewpoints went down (2A, 3B, 6A, and 8A) and the ratings for seven viewpoints stayed the same (2B, 2C, 3A, 3C, 4A, 5A, and 8B). The only location where the visual impact rating increased was Viewpoint 7A in the Dry Creek Slope Visual Assessment Unit. In the Final EIS project layout, this viewpoint was almost 2 miles from the nearest turbine, while in the SEIS project layout it is only 3/4 mile to the nearest turbine; the level of visual impact changed from Low to Moderate.

Seven new viewpoints (S5B, S6B, S7B, S7C, S8C, S8D, and S8E) in the more distant visual assessment units were added for the SEIS project layout to replace viewpoints that were no longer relevant, or that captured views from groups of farms or residences impacted by the SEIS project layout. All of the new viewpoints received visual impact ratings of Moderate to Low.

In summary, the ratings for the 24 simulations (compared to 19 in the Final EIS) that were determined to best represent visual impacts to each of the visual assessment units are as follows:

- Four viewpoints were rated High for visual impact (S1H, S1I, S1K, and S1L).

- Thirteen viewpoints were rated Moderate for visual impact (1B, 1C, 1D, S1J, S1M, 3C, S6B, 7A, S7B, S7C, S8C, S8D, and S8E).
- Eight viewpoints were rated Low or None for visual impact (2A, 2B, 2C, 3A, 3B, 4A, S5B, and 6A).

Both the Final EIS and the additional analysis in the SEIS indicate that the greatest impacts would be experienced by those observers closest to the turbines. However, the revised configuration has significantly reduced the number of residences located close to proposed turbines. It has also increased the distance between neighboring residences and the nearest turbines to more than four times their tip height.

Although the visual quality of the revised Desert Claim project has improved when compared to the Final EIS layout, there would be some new impacts associated with the new project configuration:

- A few residences nearest the Project Area will have more turbines in their view because the proposed project now consists of a single, contiguous area (compared to the Final EIS evaluation of a project area with four separate parcels).
- The introduction of turbines on lands added to the west creates additional visual impacts (rated Low and Moderate) where none existed in the Final EIS project layout, while eliminating impacts identified in the Final EIS at locations near the eastern portion of the original project that have since been eliminated. This shift of the Project Area to the west also moves visual impacts farther away from Ellensburg, which is the population core in the area.

On the whole, the visual impacts of the Desert Claim project have been reduced in a number of ways compared to the proposal evaluated in the Final EIS. These include:

- a smaller, contiguous project area;
- reduced number of turbines and turbine density;
- fewer nearby residences;
- increased distances between turbines and neighboring residences;
- reduced nighttime flashing lights and eliminated daytime strobes;
- reduced number of met towers; and
- reduced length of roads.

These changes would lessen project impacts for most viewer groups. Visual impacts may also be reduced through the use of micrositing to increase the distances of turbines within 2,500 feet of residences. While these measures and visual quality improvements would not lead to a project

that is invisible, which is impossible, they would result in a project that fits better with the landscape of the Kittitas Valley, and that better responds to the aesthetic values of the people who live in the region.

3.4.3.2 No Action Alternative

Under the No Action alternative, visual quality of the surrounding environment would not change as a result of the Proposed Project. Visual quality in and near the Project Area would continue to be influenced by existing land uses, and by potential changes in existing land uses. Continued development pressure to unincorporated rural land near Ellensburg could result in development of some lands for housing, and low density rural residential uses could expand. Alternative power generating facilities could be built in other, undetermined locations in response to state-wide demand for electricity and mandated state renewable portfolio standards. Such energy facilities, if they occurred, could have some degree of visual impact, depending on their type, location, and design.

3.4.4 Cumulative Impacts

Figure 3.4-50 at the end of this section shows the locations of the Desert Claim Project and three other approved or existing wind power projects in the general vicinity: Kittitas Valley, Wild Horse, and Vantage. The Desert Claim project is within 1/2 mile of the Kittitas Valley project, and is approximately 16 miles and 19 miles from the Wild Horse and Vantage projects, respectively.

The existing landscape in the vicinity of the Desert Claim Project and elsewhere in the Kittitas Valley has been substantially modified through agricultural practices, road construction, rural residential development, and infrastructure facilities such as electric transmission lines and irrigation canals. The cumulative visual effect of existing, approved and proposed wind power projects would represent a significant change from the baseline aesthetic condition in areas where those facilities would be visible. The Wild Horse and Vantage projects are 16 and 19 miles from the Desert Claim Project and 21 and 24 miles from the Kittitas Valley project, respectively. There are some areas near the Desert Claim and Kittitas Valley projects from which views of the Wild Horse and/or Vantage projects may also be possible, but at these distances the Wild Horse and Vantage turbines will have very little effect on views. Although sometimes visible, the scale of the distant turbines would be dominated by the shapes, colors, and patterns of the hills, ridges, valleys, and vegetation in the landscape.

Visitors and residents would be aware that there are numerous wind turbines in the greater Kittitas Valley area. Their perceptions of the area would change to some degree as a result of the scale and number of turbines. The shift and consolidation of the revised Desert Claim Project to

the west, and the reduction in the number of turbines, would likely lessen the cumulative impact of all wind power projects to local residents and to the region in general.

At night, flashing red lights on some turbines in each project, as required by the FAA, would be visible to residents and travelers within several miles of the project areas. This change in the nighttime skyline would likely be perceived by residents in the area as an adverse visual impact.

The Final EIS prepared for the nearby Kittitas Valley project indicates that, due to topographic conditions, there are no areas from which the Kittitas Valley project could be seen in the foreground with the Desert Claim project in the middleground or background (EFSEC 2007). For this evaluation, it was determined that there are several locations where the Desert Claim Project could be seen in the foreground with the Kittitas Valley Project visible in the middleground to background. In these instances, the Kittitas Valley Project would appear more distant and the turbines would appear more faint. In those views where both the Desert Claim and Kittitas Valley projects would be visible, the presence of the Kittitas Valley turbines would not add significantly to the impacts caused by the Desert Claim turbines alone. Photo simulations from four locations with views of both projects are shown and described below.

Figure 3.4-51 shows the viewpoints from which photo simulations were generated to depict cumulative visual effects. During reconnaissance and analysis, it was observed that there are few locations along public roadways or public areas in the vicinity from which both projects will be seen in the same view. The locations shown below provide a variety of views of both projects from areas to the north, northwest, and west of Ellensburg.

Cumulative Viewpoint 1 (Figure 3.4-52): *Simulated view looking north across the Greater Ellensburg Visual Assessment Unit, over the Burlington Northern RR near U.S. Highway 97 and Cascade Way*. Photographed from on top of the bridge that crosses the railroad, this is one of the only views within the Ellensburg population core from which *either* the Desert Claim or the Kittitas Valley projects would be visible. Motorists crossing the bridge in either direction will briefly have this view if they look to the northwest. Residents in the development within the foreground will most likely not see the turbines due to their lower vantage point, and the dense riparian vegetation to the north. At this distance, while turbines from both projects are visible, the foothills in the background dominate the view. Although the Kittitas Valley turbines (far left side and background left of center) add slightly to the visual impact caused by the Desert Claim turbines (center and right side), cumulatively they would not have a significant impact on the view.

Cumulative Viewpoint 2 (Figure 3.4-53): *Simulated view looking north-by-northwest from U.S. 97, ¾ mile north of intersection with Hungry Junction Road*. This viewpoint was determined to be the only location along U.S. 97 from which turbines in both the Desert Claim and Kittitas

Valley projects would be visible in the same view. Both projects would be visible to northbound travelers for approximately ¼ mile before and after the location from which the photograph was taken; in all other locations, trees or landforms would block views of at least one of the projects, and often block views of both projects. From this distance, the Desert Claim turbines (center and right side) visually appear as tall as the foothills beyond, but the Kittitas Valley turbines (mostly left side) are quite faint. Cumulatively there would not be a significant impact to the overall quality of the view.

Cumulative Viewpoint 3 (Figure 3.4-54): *Simulated view looking 7 degrees east of north, ½ mile north of the intersection of Killmore Road and Robinson Road*. Photographed from near the base of the foothills on the high southern edge of the valley that slopes down toward the Yakima River and Ellensburg, this viewpoint is elevated and a viewer is able to see both the Desert Claim project (to the right of the nearest utility pole) and Kittitas Valley project (to the left side of the pole). Although visible in the simulation, turbines in both projects are quite distant and faint; they are also dominated in scale by the foothills and Stewart Mountain Range in the distance. From this distance, the Desert Claim turbines only slightly detract from the overall visual quality of the scene; the Kittitas Valley turbines also appear quite faint. Cumulatively, there would not be a significant impact to overall visual quality.

It should be noted that straight ahead (to the north) and farther down the slope, motorists traversing the scene on I-90 would have their views of the Desert Claim project completely blocked by the long hillside/mesa that extends across the scene (Hayward Hill—shown just above the roofs on the right side of the photograph); it appears that the mesa would block I-90 motorists' views of the majority of the Kittitas Valley project as well.

Cumulative Viewpoint 4 (Figure 3.4-55): *Simulated view looking northwest from the intersection of Hungry Junction Road and Lookabout Lane, near Bowers Field Airport.* From this location on an elevated ledge just north and east of the airport, the view includes the majority of both the Desert Claim and Kittitas Valley project areas. Because of the viewpoint's elevated position on the eastern edge of the valley, most of the Desert Claim turbines are in view (center and right side), while the Kittitas Valley turbines are more faintly seen in the distance (left side and center, background). Because of their proximity and the viewing angle, the Desert Claim turbines visually reach nearly to the top of the foothills beyond and have a moderate impact upon the visual quality of the scene. The patterns they make contrast with the more typical agricultural landscape patterns and colors closer to the foreground. Although the Kittitas Valley turbines slightly increase the overall visual impact, they do not add significantly to the moderate impact that the Desert Claim turbines have upon the view.

3.4.5 Mitigation Measures

A number of visual quality improvements have been made to the Desert Claim Project, including increased turbine distances and other factors discussed in Section 3.4.3. Impacts may be further reduced by the use of micrositing to increase the distance of turbines within 2,500 feet of residences. The Project would also adhere to a number of "best practices" that pertain to design and implementation of wind farms. These measures can avoid some impacts and reduce the overall impacts of projects, but all visual impacts cannot be avoided.

Increased Turbine Setbacks. The distance separating proposed turbines from the closest residences has been increased to mitigate the visual impacts from those residences. Based on research referenced in the SEIS, at a distance of four times its height, an object does not dominate the view or appear to loom over nearby objects. All proposed turbines are at least 1,640 feet from off-site residences. There are two residences located within the Project Area that are at least 1,640 feet from the closest turbine, and these property owners have consented to the location of turbines on their property and have no objection to any associated visual impacts.

Evenly Spaced Turbine Array: Paul Gipe, in Aesthetic Guidelines for a Wind Power Future, states that, "The absence of visual order is the principal aesthetic criticism of [many] wind farms. They are often described in terms of the "disorder, disarray, or clutter" of turbines on the landscape. Maintaining order and visual unity among clusters of turbines is the single most important means of lessening the visual impact of large arrays." This best practice is also supported by research done by Thayer and Freeman, the Danish Ministry of Energy, and others (Gipe, Aesthetic Guidelines for a Wind Power Future, p. 180; Thayer and Freeman, Altamont: Public Perceptions of a Wind Energy Landscape, p. 395). The currently proposed array of turbines is fairly evenly spaced, with no major gaps or isolated groupings. This represents an improved project configuration compared to the proposal analyzed in the Final EIS.

Uniform Height and Type of Turbines and Towers: Many wind farm projects contain a variety of turbine types and tower heights, although research has shown that arrays of turbines and towers that are of the same height and type are preferred (Gipe, Aesthetics...p. 183, Thayer and Freeman, Public...p. 395). The towers and turbines that are being proposed for this Project are of a consistent height and type.

Commitment to Remove Decommissioned Turbines: Malfunctioning, inoperative or towers without turbines cause negative public responses. In their research, Thayer and Hansen deduced that, "the single most significant action wind companies could take to boost public acceptance [of wind farms] is to quickly fix broken turbines and remove

those that are not repairable" (Thayer and Hansen, "*Wind on the Land*," 68-73). The project proponent has committed to keep conspicuous turbine malfunctions to a minimum and to remove any towers that are decommissioned.

In addition to the measures above, the Applicant has agreed to implement the following measures:

Visual Integration:

- Construct required ancillary structures of local materials and maximize their fit in the vernacular landscape by studying local building types and siting them sensitively.
- Use native shrub-steppe vegetation around buildings and equipment boxes to integrate the structures into the surrounding landscape.
- Use existing roads to access turbines. Minimize new road building.
- Do not piggyback advertising, cell antennas, or other clutter on the turbines. Do not prominently display the logo of the manufacturer on the nacelle.
- Sculpt natural landforms and plant foreground screening native vegetative along some nearby roads and around residences with expected significant visual impacts.
- Use low-reflectivity, neutral-color finishes for turbines, equipment boxes, substation equipment, and O&M building. Earth-tone finish would blend in best with the surrounding landscape.
- Use only minimum required lighting on turbines (aviation warning lighting) required by the FAA, and minimize security lighting at the substation and O&M facility. Make any ground level security lighting motion-sensitive so that most of the time it does not impact the night landscape.
- Use lighting devices designed to be least visible from ground level.
- Synchronize blinking of aviation warning night lights and maximize period in light-off condition.

Ecological Restoration and Management of Disturbed Areas:

- Remove construction debris.
- Replace native vegetation disturbed in non-road surface areas or non-turbine areas.
- Seed or cover temporarily stockpiled materials and disturbed sites to reduce dust and prevent erosion.

Equipment Maintenance:

- Maintain uniform, high-quality turbine towers, nacelles, and blades. Any replacements should maintain uniform height, model, color, etc.
- Promptly repair all parts of non-functioning turbines.
- Keep O&M area and turbines clean.

Information and Education:

- Notify the local community of the timing and duration of construction.

3.4.6 Significant Unavoidable Adverse Impacts

Development of the Desert Claim Project as currently proposed would result in unavoidable impacts to the visual environment. Those residents living closest to the Project might find the impacts to be significant and adverse. Some of these visual impacts may also be reduced through micrositing of turbines. Wind turbines would be visible to varying degrees from other locations, though views would be more distant and the level of visual impact would be lower. While mitigation for many types of built projects may include measures like screening the project from view with vegetation, or constructing the project with materials that blend with the vernacular architecture, wind farms cannot be completely hidden from view or blended into their surroundings. Some degree of visibility is inherent in a wind power facility.

Figure 3.4-5. View 1B – SEIS Existing View Looking NW across the Northeast Valley Visual Assessment Unit from Intersection of Hungry Junction Road and Lookabout Lane

Figure 3.4-6. View 1B – SEIS Simulated View

Figure 3.4-7. View 1C – SEIS Existing View Looking NE across the Northwest Valley Visual Assessment Unit along Smithson Road near Highway 97

Figure 3.4-8. View 1C – SEIS Simulated View

Figure 3.4-9. View 1D – SEIS Existing View Looking SW across the Northwest Valley Visual Assessment Unit from Immediately N of the Project Area

Figure 3.4-10. View 1D – SEIS Simulated View

Figure 3.4-11. View S1H – SEIS Existing View Looking W-by-SW across the Northwest Valley Visual Assessment Unit from Robbins Road, just N of North Branch Canal

Figure 3.4-12. View S1H – SEIS Simulated View
Note: This is a new viewpoint that was not included in the Final EIS.

Figure 3.4-13. View S1I – SEIS Existing View Looking NE across the Northwest Valley Visual Assessment Unit from Reecer Creek Road, just N of North Branch Canal

Figure 3.4-14. View S1I – SEIS Simulated View
Note: This is a new viewpoint that was not included in the Final EIS.

Figure 3.4-15. View S1J – SEIS Existing View Looking W-by-NE across the Northwest Valley Visual Assessment Unit from Smithson Road, just E of Green Canyon Road

Figure 3.4-16. View S1J – SEIS Simulated View
Note: This is a new viewpoint that was not included in the Final EIS.

Figure 3.4-17. View S1K – SEIS Existing View Looking S-by-SW across the Northwest Valley Visual Assessment Unit from Reecer Creek Road, just N of the Project Boundary

Figure 3.4-18. View S1K – SEIS Simulated View
Note: This is a new viewpoint that was not included in the Final EIS.

Figure 3.4-19. View S1L – SEIS Existing View Looking SE across Northwest Valley Visual Assessment Unit from Katie Ln., 1/8 Mile E of Green Canyon Rd., 1/8 Mile N of Project Limit

Figure 3.4-20. View S1L – SEIS Simulated View
Note: This is a new viewpoint that was not included in the Final EIS.

Figure 3.4-21. View S1M – SEIS Existing View Looking NE across the Northwest Valley Visual Assessment Unit from Smithson Rd., ¼ Mile W of Howard Rd., just S of Project Area

Figure 3.4-22. View S1M – SEIS Simulated View
Note: This is a new viewpoint that was not included in the Final EIS.

Figure 3.4-23. View 2A – SEIS Existing View Looking SW across Northwest Valley Visual Assessment Unit from Wilson Creek Road
Note: There are no turbines visible from this viewpoint in the current proposal.

Figure 3.4-24. View 2B – SEIS Existing View Looking W across the Northeast Valley Visual Assessment Unit from Wilson Creek Road on Rabbit Hill

Figure 3.4-25. View 2B – SEIS Simulated View

Figure 3.4-26. View 2C – SEIS Existing View Looking NW across the Northwest Valley Visual Assessment Unit from the N end of Bowers Field at Hungry Junction Road

Figure 3.4-27. View 2C – SEIS Simulated View

Figure 3.4-28. View 3A – SEIS Existing View Looking N across the Greater Ellensburg Visual Assessment Unit over the Burlington Northern Railroad near Hwy 97 and Cascade Way

Figure 3.4-29. View 3A – SEIS Simulated View

Figure 3.4-30. View 3C – SEIS Existing View Looking NW across the Greater Ellensburg Visual Assessment Unit from Reed Park in Ellensburg

Figure 3.4-31. View 3C – SEIS Simulated View

Figure 3.4-32. View S5B – SEIS Existing View Looking N-by-NE from the Southwest Valley Visual Assessment Unit ½ mile N of the intersection of Killmore Rd. and Robinson Rd.

Figure 3.4-33. View S5B – SEIS Simulated View

Note: This viewpoint was selected as an alternative to 5A since recent development there has blocked views of most of the wind farm.

Figure 3.4-34. View 6A – SEIS Existing View Looking NE from the Hayward Hill Visual Assessment Unit at the Top of the Hill

Figure 3.4-35. View 6A – SEIS Simulated View

Figure 3.4-36. View S6B – SEIS Existing View Looking N from above Highway 97 in the Hayward Hill Unit from a Group of Residences roughly 2 miles S of the Project Boundary

Figure 3.4-37. View S6B – SEIS Simulated View
Note: This viewpoint was added because it provides clear view of new property in the SW quadrant of the Project Area where no turbines were previously proposed.

Figure 3.4-38. View 7A – SEIS Existing View Looking NE from the Dry Creek Slope Visual Assessment Unit 1/3 mile N of Smithson Road, off Highway 97

Figure 3.4-39. View 7A – SEIS Simulated View

Figure 3.4-40. View S7B – SEIS Existing View Looking SW from the Dry Creek Slope Visual Assessment Unit from Hwy 97 at Driveway 16011, roughly ½ Mile W of the Project Area

Figure 3.4-41. View S7B – SEIS Simulated View
Note: This viewpoint was added because it provides clear view of new property in the SW quadrant of the Project Area where no turbines were previously proposed.

Figure 3.4-42. View S7C – SEIS Existing View Looking E-by-NE from a Hilltop in Dry Creek Slope Visual Assessment Unit, 1/3 mile W of Hwy 97, due W of Smithson Road

Figure 3.4-43. View S7C – SEIS Simulated View
Note: This viewpoint was added because it provides clear view (from a group of farms) of new property in the SW quadrant of the Project Area where no turbines were previously proposed.

Figure 3.4-44. View S8C – SEIS Existing View Looking S from the Table Mountain Slope Visual Assessment Unit over the Kittitas Basin, Slightly W of Final EIS Viewpoint 8A

Figure 3.4-45. View S8C – SEIS Simulated View
Note: This viewpoint was selected as an alternative to 8A since the slope in foreground blocked view of part of the SEIS turbine layout.

Figure 3.4-46. View S8D – SEIS Existing View Looking W from the Table Mountain Slope Visual Assessment Unit from Robbins Road

Figure 3.4-47. View S8D – SEIS Simulated View

Note: This viewpoint was selected as an alternative to 8B because it was oriented to an area where turbines are no longer being proposed.

Figure 3.4-48. View S8E – SEIS Existing View Looking S from the Table Mountain Slope Visual Assessment Unit toward the WDNR Property from Upper Green Canyon Road

Figure 3.4-49. View S8E – SEIS Simulated View
Note: This viewpoint was added because it provides clear view of new property in the SW quadrant of the Project Area where no turbines were previously proposed.

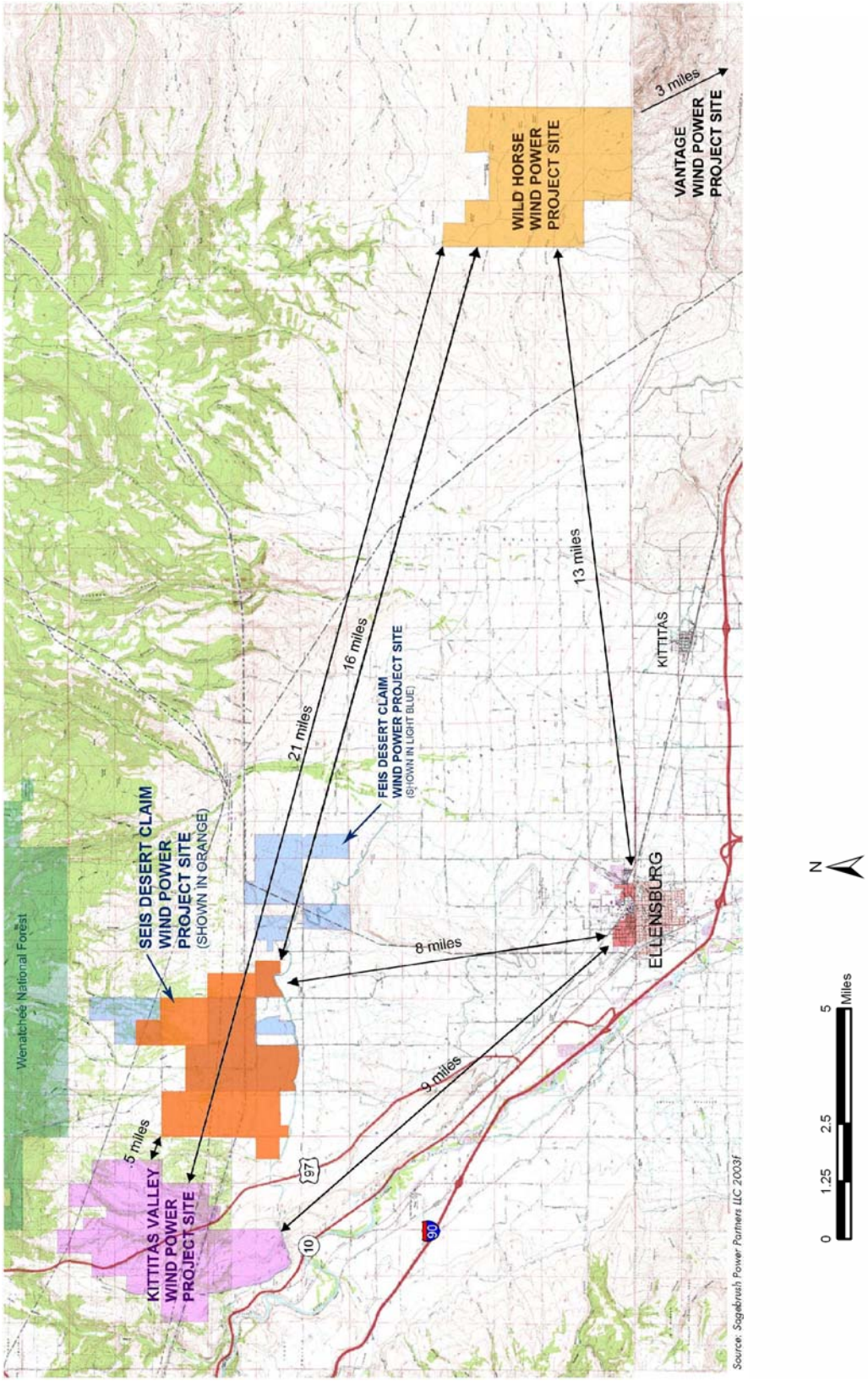


Figure 3.4-50. Visual Resource Cumulative Impact Study Area
Note: Map modified from original Cumulative Impacts Map in Kittitas Valley Project Final EIS.

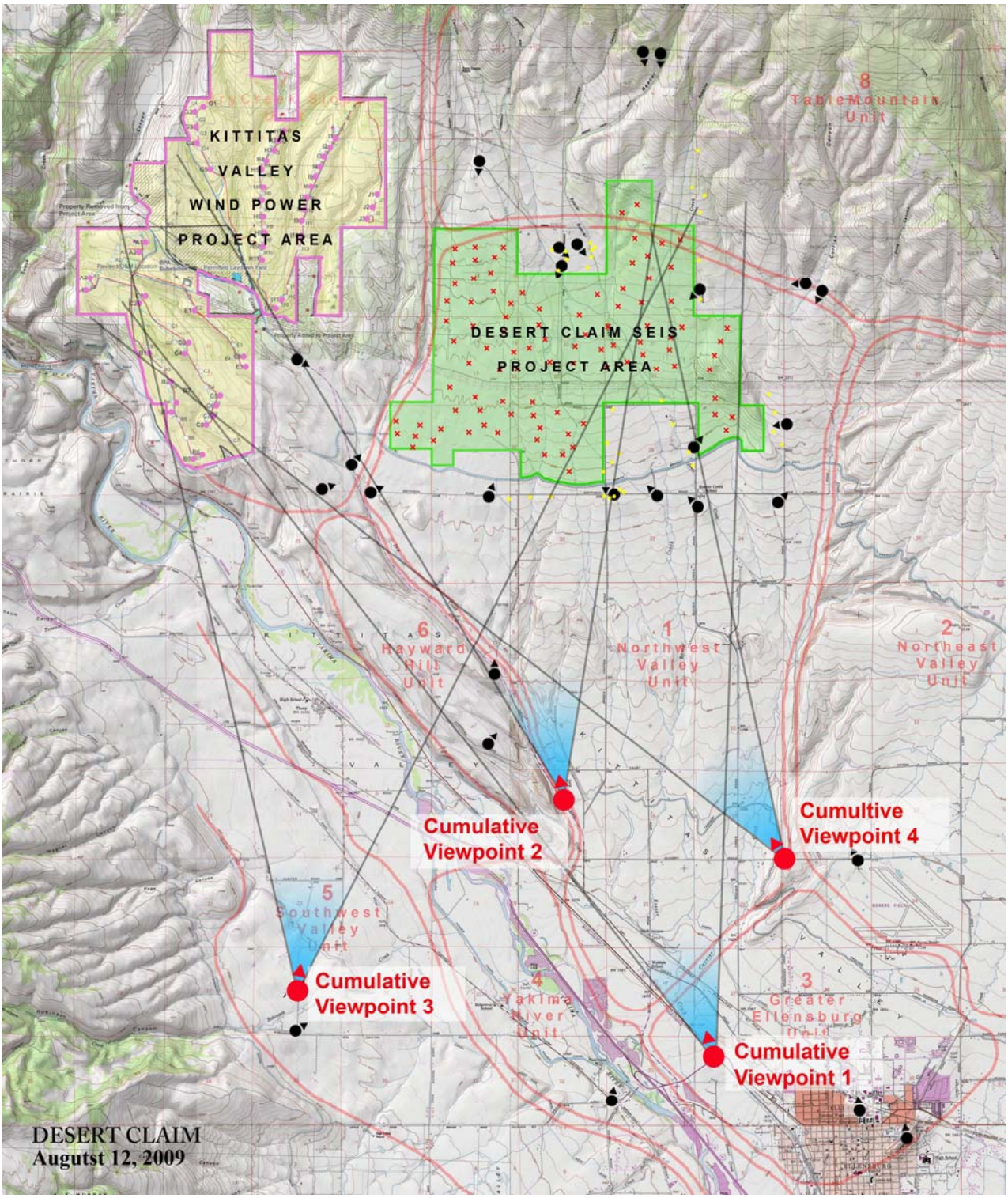


Figure 3.4-51 Cumulative Impacts Viewpoints for Simulations of Desert Claim and Kittitas Valley Wind Power Projects

Figure 3.4-52 Cumulative Viewpoint 1 Simulation

Figure 3.4-53 Cumulative Viewpoint 2 Simulation

Figure 3.4-54 Cumulative Viewpoint 3 Simulation

Figure 3.4-55 Cumulative Viewpoint 4 Simulation