Update on Vegetation and Wildlife Impacts from the New Desert Claim Project Area

October 31, 2006

Technical Report

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INTRODUCTION

enXco, Inc. is submitting an Application for Site Certification ("ASC") to the Washington State Energy Facility Site Evaluation Counsel (" EFSEC") for the Desert Claim Wind Power Project (the "Project"). The Project is a renewable wind energy generation facility that will consist of up to 90 wind turbines and have a nameplate capacity of up to 180 megawatts (MW). The Project will be located within a project area of 4,783 acres in unincorporated Kittitas County, approximately 8 miles northwest of Ellensburg, Washington. The current proposal is a modified version of the Project considered by the Kittitas County Board of County Commissioners and evaluated in the County's August 2004 Final Environmental Impact Statement. Desert Claim, the applicant, modified the Project to further reduce potential impacts and to respond to concerns expressed during the County process.

This report provides details on how the changes in the Project may affect the potential for impacts to vegetation and wildlife.

PROJECT DESCRIPTION

The new Project area is now a contiguous block of land that significantly overlaps the previous western portions of the project area (Figure 1). The most significant change in location of the Project is that the areas in the southeast of the original project area have been omitted.

The turbine mostly likely used for the new project is slightly larger than the ones previously considered. The REpower MM92, a 2.0 MW nameplate capacity turbine, is now being considered for this Project, with a rotor diameter of 92.5 m (303 ft) and hub height of 80 m (262.5 ft), resulting in a maximum blade reach of 126.25 m (414 ft.). In the DEIS, a maximum turbine envelope with a resulting maximum blade reach of 120 m (393ft) was considered into which each of the considered wind turbine manufacturers and models would fit. The maximum blade reach of the turbine now being considered is slightly taller (414 ft) than the reach considered (393 ft) in the DEIS. Otherwise, the total number of MW (180 MW) for the revised project of 90 turbines is the same as previously considered. While this particular turbine was not discussed in the DEIS, another 2-MW turbine (Vestas) was considered in the DEIS.

PROJECT AREA VEGETATION

Vegetation in the Project area was mapped according to vegetation types (Young et al. 2003a). This mapping was updated in fall 2006 based on the new Project area, the results of vegetation mapping in the surrounding areas, and aerial photography. This mapping was updated in fall 2006 based on the new Project area. The new Project area includes parcels totaling 4,783 acres on which Desert Claim has landowner permission to develop the Project. Based on the new project area and updated vegetation mapping, habitat acreages in the Project area were revised and included in **Table 1**.

Table 1
Vegetation Types in the Project Area

Vegetation Type	Approx. Acres	Percent of Project Area	General Habitat Description
Agricultural	249	5.2	Agricultural areas are sites used for irrigated hay meadows that are periodically mowed.
Developed	10	0.2	Areas where human activity has removed or altered natural vegetation, such as residential homes and farm buildings and yards.
Grassland	2291	47.9	Areas dominated by grass species, primarily bunchgrasses bluebunch wheatgrass, Sandberg's bluegrass, cheatgrass, and bulbous bluegrass.
Grassland/ Lithosol	201	4.2	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	8	0.2	Areas of open water including natural ponds, stock ponds, and the irrigation canal.
Pine Forest	30	0.6	Pine forest dominated by Ponderosa pine found in the higher elevations of the northern most parcel.
Riparian Forest	30	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 Shrub	110	2.3	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	1768	37.0	Upland areas dominated by shrubs, primarily bitterbrush and rigid sagebrush, with an understory of mixed grasses and forbs. 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	87	1.8	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[1]	4783	100	

[1] Acreage total based on GIS mapping and tabulation.

Vegetation in the Project area was mapped and classified into ten types (**Table 1, Figure 2**). The primary vegetation type is grassland, composing nearly half of the Project area (47.9 percent), primarily in the eastern and central parcels. Shrub-steppe is the second most common vegetation type (37.0 percent of the Project area), followed by agricultural areas (5.2 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 (4.2%), riparian shrub (2.3%), wet meadow (1.8%), riparian forest (0.6%), pine forest (0.6%), open water (0.2%), and developed (0.2%).

The Project area has been decreased by approximately 450 acres from the previous project area identified in the DEIS. The descriptions of the different types of vegetation found in the EIS have not changed.

IMPACTS TO VEGETATION AND WILDLIFE

The following sections describe impacts to vegetation and wildlife from the revised Project, focusing on anticipated changes to impacts from the previous layout. In addition, new approaches to the estimation of impacts are described, especially for predicting bird and bat mortality. Because of large differences in turbine sizes, a different approach than using a per turbine estimate has been advocated at a national level since the 2003 DEIS was written. The approach is to standardize data on a per MW nameplate capacity 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 the mortality is proportional to the rotor-swept area of the turbine. This report will use the MW nameplate capacity.

Vegetation

Based on GIS analysis of the latest proposed Project layout, an estimated 76.5 acres of vegetation in the Project area would be permanently occupied by Project facilities and an additional 280.5 acres would be temporarily disturbed (**Table 2**). These calculations do not account for Project facilities that have not yet been sited, including the O&M facility and the construction staging/storage areas, which would add no more than 5 acres of disturbed area. Of the disturbed areas, the access roads account for most of the permanent impacts to vegetation (58.2 acres). Most facilities would be located in shrub-steppe and grassland habitat types. An estimated 29.9 acres of shrub-steppe would be permanently impacted. An estimated 42.8 acres of grassland (including the grassland/lithosol type) would be permanently impacted. In addition, an estimated 1.5 acres of agricultural lands would be permanently impacted, as well as 1 acre of pine forest, 0.5 acres of riparian forest, 0.3 acres of riparian shrub, 0.3 acres of open water, and 0.2 acres of wet meadow. Desert Claim working with their wetlands consultant have adjusted the layout in the areas of the potential wetlands to avoid all impacts to this resource.

The total acres of temporary and permanent impact are less with the new layout than the previous layout (see Table 3.4-2, page 3-65 of DEIS). Approximately 30 less acres of temporary impacts and 2 less acres of permanent impact occur with the new project layout.

Rare Plants

Due to the absence of known populations within the previous project area, the overlap of the previous project area with the new Project area, and similarity between the unsurveyed areas of the new Project area with the old project area, no Project-related impacts are anticipated to rare plant species. These rare species include federally listed endangered, threatened, proposed, or candidate plant species and Washington State endangered, threatened, sensitive, or review plant species. However, rare plant surveys may be required in the new areas prior to construction.

Table 2. Approximate acres of impact by facility type.

FACILITY	VEGETATION TYPE	APPROXIMATE AREA OF IMPACT (ACRES) TEMPORARY	PERMANENT
Turbines[a]	Agricultural	1.149	0.110
	Grassland	62.220	5.607
	Grassland/Lithosol	5.871	0.580
	Open Water[g]	1.098	0.110
	Pine Forest	0.200	0
	Riparian Forest	1.438	0.186
	Riparian Shrub	0.121	0
	Shrub Steppe	35.910	3.191
	Shrub Steppe – Dense	0.987	0.079
	Wet Meadow[g]	0.639	0.004
Access Roads[b]	Agricultural	3.216	1.278
	Grassland	75.380	30.080
	Grassland/Lithosol	6.291	2.492
	Open Water	0.444	0.172
	Pine Forest	2.576	1.050
	Riparian Forest	0.591	0.227
	Riparian Shrub	0.462	0.183
	Shrub Steppe	55.820	22.360
	Shrub Steppe – Dense	0.508	0.194
	Wet Meadow	0.408	0.160
Collection System Buried Along Project Roads[c]	Agricultural	0.511	0.128
	Grassland	11.830	2.954
	Grassland/Lithosol	0.640	0.160
	Open Water	0.068	0.017
	Riparian Forest	0.089	0.022
	Riparian Shrub	0.073	0.018
	Shrub Steppe	8.433	2.107
	Shrub Steppe – Dense	0.076	0.019
	Wet Meadow	0.064	0.016
Buried Cross-Country[d]	Agricultural	0.050	0.013
	Grassland	2.244	0.559
	Riparian Forest	0.068	0.017
	Riparian Shrub	0.331	0.083
	Shrub Steppe	0.735	0.183
	Shrub Steppe – Dense	0.022	0.005
	Wet Meadow	0.025	0.006
Potential Directional Boring[e] (Could reduce impacts of cross-country collection system)	Grassland	0.330	0.081
	Riparian Forest	0.021	0.005
	Shrub Steppe	0.013	0.003
	Wet Meadow	0.0001	0
Substation[f]	Grassland		0.292
	Shrub Steppe		1.742
Total		280.5	76.5

[a] Assumes construction disturbance for each turbine pad and transformer will temporarily affect a 130-ft radius around the tower (1.25 acres); area of permanent impact based on a 39-ft radius tower pad (0.11 acre).

[b] Assumes a 50-ft wide temporary disturbance corridor and a 20-ft wide permanent disturbance corridor.

[c] For buried collection system we assume an 8-ft wide temporary disturbance corridor and a 2-ft wide permanent disturbance corridor. A 20% factor is applied for temporary disturbance, and a 5% factor is applied for permanent disturbance where the collection system is buried within the access roads.

[d] Assume an 8-ft wide temporary disturbance corridor and a 2-ft wide permanent disturbance corridor.

[e] If directional boring is used, the impacts of the buried cross-country collection system may be reduced. These values represent the maximum impact reduction if all directional boring possibilities are used.

[f] Based on the footprint of the substation.

[g] Desert Claim has worked with their wetland consultants to adjust the facilities in and near the wetlands so that the no actual temporary or permanent impacts will occur to any wetlands from any of the project facilities

Birds

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. The change in these potential impacts from the previous proposal is difficult to determine but due to the overall decrease in size of the project the potential for these impacts to occur would also decrease.

Potential mortality from construction equipment on site is expected to be quite low and similar to other wind projects. The risk of mortality from construction to avian species is most likely limited to potential destruction of a nest with eggs or young for ground- and shrub-nesting species when equipment initially disturbs the habitat. Because less vegetation will be disturbed with the new Project, the risk of destruction of a nest with eggs or young will be lower. Disturbance-type impacts can be expected to occur if construction activity occurs near an active nest or primary foraging area. Disturbance-type impacts are also expected to decrease with the smaller proposed Project.

Raptor Nesting

Based on the previous avian studies, raptor nest density in the original project area and within a 2-mile buffer of the site for buteos was 0.28 nest/mi^2 (0.11 nest/km^2) and for all raptors was 0.34 nest/mi^2 (0.13 nest/km^2). Raptor nest density around the new proposal, including a 2-mile buffer, for buteos is 0.19 nest/mi^2 (0.07 nest/km^2) and for all raptors is 0.31 nest/mi^2 (0.12 nest/km^2). 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. This potential impact will decrease with the new proposal due to the lower nest density in this area. There were only 3 active nests, based on the 2003 survey, within ½ mile of the new Project boundary (3 red-tailed hawks, Figure 3). Some of the higher nest densities occurred in the south east area of the original project and that area has been dropped. Also,

Wilson Creek falls outside the 2-mile buffer of the new site. It is unlikely that construction of the new Project will result in significant disturbance or displacement impacts on nesting raptors.

Mortality

Impacts of the proposed Project are projected primarily based on data collected at existing regional wind power facilities: the Vansycle Wind Plant, Oregon (Erickson et al. 2000); the Stateline Wind Project, Washington and Oregon (Erickson et al. 2003a); the Klondike I project, Oregon (Johnson et al. 2003); Nine Canyon Wind Project, Washington, (Erickson et al. 2003b); and the Combine Hills project, Oregon (Young et al. 2005); where mortality estimates adjusted for carcass removal and searcher efficiency biases have been made for birds and bats.

Based on the avian studies, use by birds of the Project area is similar to other wind plants studied. Species diversity of the site was higher than some other studies, but overall avian use estimates were similar. Collision-related impacts (fatalities) would not be expected to exceed what has been observed at other wind plants in the northwest. In general, because of the smaller proposed Project size with fewer turbines, total mortality impacts are expected to be less.

Passerines

Passerines have been the most abundant fatalities at other wind plants 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. Average passerine and small bird mortality for the five wind projects listed above in Washington and Oregon has been 1.70 fatalities per turbine per year (**Table 3**). Because of large differences in turbine sizes, a different approach than using a per turbine estimate has been advocated at a national level since the 2003 DEIS was written. The approach is to standardize data on a per MW nameplate capacity 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 the mortality is proportional to the rotor-swept area of the turbine. Considering these mortality results and passerine use estimates at these wind plants, it is estimated that potential passerine (all small bird) mortality at the proposed Project would be similar to the average or approximately 1.68 small birds per MW per year (**Table 3**). This would result in approximately 300 small bird fatalities per year at the Project if 180 MW are constructed. This estimate would be the same under the previous proposal, since the total MW of the project are the same (180 MW). A more conservative approach is to use the range of mortality, and in that case, approximately 100 to 500 passerine fatalities are predicted.

Table 3
Mean bird mortality estimates based on fatality studies at regional wind projects.

		Bird Mortality (#/turbine/year)			Bird Mortality (#/MW/year)		
Project	size of turbine (MW)	All Birds	Passerines1	Raptors	All Birds	Passerines1	Raptors
Vansycle, OR	0.66	0.63	0.42	0	0.95	0.64	0.00
Klondike I, OR	1.5	1.42	1.16	0	0.95	0.77	0.00
Combine Hills, OR	1	2.56	1.89	0	2.56	1.89	0.00
Nine Canyon, WA	1.3	3.59	3.31	0.07	2.76	2.55	0.05
Stateline, WA/OR	0.66	1.93	1.7	0.05	2.92	2.58	0.08

Average	1.02	2.03	1.7	0.02	2.03	1.68	0.03

[1] Passerines and other small bird estimates are lumped together

Raptors

Compared to other wind plants studied in the region, raptor use for the Desert Claim site was above average, with slightly more than one raptor (1.15) observed each survey. The majority of the raptor sightings were red-tailed hawks during the spring, summer, and fall, and rough-legged hawks during the winter. Average raptor mortality for the five wind projects listed above in Washington and Oregon has been 0.03 fatalities per MW per year (**Table 3**). Considering these mortality results and raptor use estimates at these wind plants, it is estimated that potential raptor mortality at the proposed Project would be higher than the average. Using the highest raptor mortality estimate in the region (0.08 raptors per MW per year), potential raptor mortality would 14 raptors per year and the range of potential raptor mortality would likely be from 5-14 per year.

Another recent analysis suggests a correlation between raptor use and raptor mortality. This analysis was conducted using several studies that were only recently completed. Figure 1 shows the relationship between raptor use (standardized to 20-minute surveys) and raptor mortality adjusted for site-specific estimates of scavenging and searcher efficiency, and raptor use using 360-degree viewshed surveys from the following projects:

Study Area	Reference
Combine Hills, OR	Young et al. 2005
Diablo Winds, CA	WEST 2006
Vansycle, OR	Erickson et al. 2000
Stateline, WA/OR	Erickson et al. 2004
Nine Canyon WA	Erickson et al. 2003b
Klondike, OR	Johnson et al. 2003
Buffalo Ridge, MN	Johnson et al. 2000
High Winds, CA	Kerlinger et al. 2006
Foote Creek Rim, WY	Young et al. 2003

A strong relationship is apparent in this analysis. The 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 (**Figure 4**).

Estimated raptor use for Desert Claim (1.15/survey) yields a prediction of 0.15 raptor fatalities/MW/year from this regression model, or 27 raptors for the entire project. Since the project size in terms of MW has not changed from the project described in the DEIS, the estimates of mortality using these two new models would be the same for both projects. These estimates using the new models and approaches are higher than predicted in the DEIS. However, these estimates (or significantly higher estimates) would not result in any population level consequences (e.g., within the Kittitas Valley, within the Columbia Basin, or some larger population) for the species likely to be impacted. 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 well as in the Columbia Basin and nationally.

All Avian Mortality

The range of bird mortality for the five regional wind projects listed above is approximately 1 to 3 birds per MW per year for all birds with an average of 2.03 birds per MW per year (**Table 3**). Using this range, avian mortality at the proposed Project would be approximately 180 to 540 birds per year if 180 MW are built. Since the total MW has not changed, this approach would yield the same avian mortality for both the previously proposed Project and the new Project.

Carcass searches at other wind projects have found avian fatalities associated with guyed met towers but not with un-guyed towers. As currently planned, the proposed Project would have 5 permanent un-guyed met towers. Based on the result of the above studies, no avian fatalities are expected that would be associated with the met towers.

Waterfowl

Little waterfowl mortality has been documented at other wind plants. 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. Waterfowl mortality 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 which had little waterfowl use.

Small Mammals

Impacts to ground-dwelling mammals occurring on site would include fatalities from construction activities, loss of habitat, and disturbance or displacement. The incremental change in these types of impacts from the new proposal over the previous proposal is difficult to estimate; however, it is expected that the overall impacts would be less due to the smaller project size. Small mammals are expected to repopulate impact areas after construction activities cease and reclamation is complete, and they may re-colonize areas quicker due to the smaller project. Some small mammal fatalities can be expected from O&M vehicle traffic, but because the Project would be smaller overall, these impacts would be less.

A comment submitted during scoping for the original EIS expressed concern that the project might result in declines in the raptor population that would lead to an increase in the population of rodents that are prey species for raptors. Because certain rodents such as deer mice are carriers of hantavirus, which is an airborne pathogen that can be contracted by humans, the concern was that this indirect impact on rodents could result in increased risk of human exposure to hantavirus. Overall, the total rodent population in the area is likely a function of environmental conditions and not controlled by predators. The small impacts to raptors anticipated from the project would not have a noticeable or measurable affect the rodent population.

Bats

Research at other wind plants indicates that the primary impact to bats appears to be risk of collision for fall migratory bat species with hoary and silver-haired bats being the most prevalent Pacific Northwest fatalities (see 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). During construction, impacts to bats and bat habitat on the project site will be minimal. There will be some loss of riparian vegetation where bats may forage but this is not expected to have a measurable effect on resident bats. Hoary and silver-haired bats, the two species most at risk, may use forested habitats to the

north but there is little forest habitat on the site and loss of habitat or disturbance impacts from construction on these species is not expected to occur.

Most bat fatalities found at wind projects have been tree (forest) dwelling fall migratory species, with hoary and silver-haired bats being the most prevalent Pacific Northwest fatalities. Fatality estimates for the five regional wind projects studied have ranged from 0.77 to 2.47 bats per MW per year with an average of 1.59 bats per MW per year (**Table 4**). In these studies more than 90% of the bat fatalities have been hoary and silver-haired bats. Some projects in other parts of the country have shown that risk to bats may be greater in forested environments (e.g. Kerns and Kerlinger 2004; Nicholson 2003). Bat mortality at the Desert Claim Project is not expected to greatly exceed the other regional wind projects studied; however, it may be higher due to the proximity of forests to the north and west. Using a per MW basis, bat mortality at the site may be approximately 1.0 - 3.0 bats per MW per year or between 180 and 540 total bats per year if 180 MW are constructed and would be similar to the previous proposed project.

Table 4
Mean bat mortality estimates based on fatality studies at regional wind projects.

Project	size of turbine (MW)	Bat Mortality (#/turbine/year)		References
Vansycle, OR	0.66	0.74	1.12	Erickson et al. 2000
Klondike I, OR	1.5	1.16	0.77	Johnson et al. 2003
Combine Hills, OR	1	1.88	1.88	Young et al. 2005
Nine Canyon, WA	1.3	3.21	2.47	Erickson et al. 2003b
Stateline, WA/OR	0.66	1.12	1.70	Erickson et al. 2004
Average	1.02	1.62	1.59	

Reptiles and Amphibians

Aquatic or moist habitats for amphibians and reptiles are generally restricted to the riparian, wetland, and pond areas within the study area. Substantial impacts to these areas are not anticipated due to regulatory requirements to minimize impacts, and erosion and sedimentation prevention methods are expected in adjacent upland construction areas. Due to the overall reduction in the project size, impacts to these habitats will decrease and thus the potential for impacts to aquatic wildlife will decrease.

As with ground-dwelling mammals, snakes and lizards that occupy upland areas may experience fatalities due to construction activity. Due to the overall reduction in project size, the potential for and magnitude of this impact will be less than the previous proposal. Some reptile fatalities can be expected from O&M vehicle traffic, but again, because the project would be smaller overall with fewer roads, these impacts would be less.

Big Game

The new Project area is within the Ellensburg mule deer winter range and two high-density deer wintering areas occur within 1.5 miles of the project. Also, the Quilomene elk migration corridor is an important spring pathway that encroaches upon the project's north section. Project construction and operation could result in disturbance or displacement impacts to big game, including deer wintering in the area, which, during very severe winters, could result in mortality impacts due to animals being forced into marginal habitat that does not sustain them over winter. Overall these types of impacts from the new proposal are expected to be less because of the smaller project area. There will be less overall road and turbine strings that could fragment habitat or create barriers to movement. Also the new Project area is concentrated more around existing infrastructure (e.g., transmission lines, local roads) than the previous proposal, which reduces the amount of additional habitat fragmentation that would occur from the project. The smaller Project should result in less displacement or less potential for displacement to adjoining cropland, reducing the possibility that crop damage claims in the project vicinity may change.

The northernmost section of the Project area overlaps approximately 320 acres of the southern edge of the Quilomene elk migration corridor. It is unknown to what extent this area is used by elk, or if all of the new Project is within view of the migration corridor. If this area of the Project influences spring elk movement, it is expected that elk will shift their path to the north without migratory hindrance due to the large size of the corridor. There is no change in this potential impact from the previous proposal, as the same northern project section was included in both project layouts.

Temporary loss of habitat from Project construction is a relatively minor impact due to expected vegetation reclamation and the large expanse of suitable habitat for mule deer in the region. Once construction is complete, it is expected that deer would become habituated to wind turbines and occupy areas within the wind plant. There will also be intermittent disturbances from vehicle and human traffic during regular O&M activities, and also from turbine noise and shadow flicker of moving blades. If deer tolerance thresholds are exceeded by these disturbances, it is expected that mule deer will seek remote areas of nearby ravines or forests. Should the facility eventually result in a sanctuary for big game due to reduced hunting pressure, seasonal use of the wind plant by big game may increase. However, the new proposal is smaller and would not create as large of a sanctuary area.

Threatened and Endangered Species

The previous environmental impact analysis determined that the original project would have no effect on the majority of the State or Federally listed threatened or endangered species potentially occurring in or near the Project area. Two federally threatened species, bald eagle and steelhead, could occur in the Project area and therefore may be at risk of adverse impacts from the Project

Bald eagles occur in the Project area during the winter from approximately late December to early April. There is no evidence that bald eagles breed in the Project area or nearby although the Yakima River riparian corridor provides suitable breeding habitat. Potential impacts to bald eagles identified in the previous analysis included disturbance or displacement during the winter season, potential loss of roosting and foraging habitat, and potential mortality due to turbine collisions. The new proposal which is smaller in size and with fewer turbines generally will have less potential impact to bald eagles than the original proposal. The Project will not affect the Yakima River riparian corridor or bald eagle roost sites and habitat along the Yakima River.

Temporary loss of potential isolated roosting habitat (scattered patches of trees) due to construction disturbance would be for the short duration of the construction period (9-12 months), most of which will be outside the winter season and would affect even less of the available roosting habitat than the original proposal. During avian studies at the site, bald eagles were observed using the Wilson Creek riparian corridor and Wilson Creek Canyon to the northeast of the original project area. While no roosts were found in this area, the current proposal is greater than 3 miles from this area, further reducing the possibility of disturbance impacts at roost sites. Wintering bald eagles forage throughout the surrounding area on carrion, livestock by-products, and fish in the Yakima River. To the extent that carrion or livestock by-products occur on site, bald eagles may forage on the site. Cattle operations in the Project area are considered independent of the wind project and the Project is not expected to reduce foraging opportunities for bald eagles unless this is used as a mitigation measure to minimize bald eagle occurrence in the wind project. Bald eagles flying within the Project area would have some exposure to turbine-caused mortality; however, there have been no documented bald eagle fatalities at wind plants and the number of turbines proposed is less resulting in less over all collision risk. The Project also occupies a smaller overall area resulting in less potential to disrupt normal movement patterns of wintering eagles in the valley. Any mortality that might occur over the Project life would be at a very low level and would not have a measurable effect on the bald eagle population. Operation of the Project should have minimal disturbance effect on bald eagles, based primarily on their relatively low use of the Project area (see Young et al. 2003a) and the fact that the bald eagle occupation period overlaps the least windy time of year.

For steelhead trout, the WDFW provided information indicating that due to diversion of water from First Creek into Green Canyon and eventually to the Reecer Creek subbasin, steelhead could possibly occur in Reecer Creek which flows through the western half of the Project area. Also, the Columbia River district population segment of bull trout is listed as a threatened species under the Endangered Species Act and potentially occurs downstream in the Yakima River. Due to steelhead occurring within the Project area, and the potential for downstream impacts (see **Section 3.4.3 of the DEIS**) the Project has the potential to adversely affect these species. The Reecer creek drainage where steelhead potentially occur is within the new proposal Project area. Potential impacts to steelhead from the new proposal are not expected to change over the original proposal. In essence, the portion of the original proposal that could potentially affect steelhead was the western most sections around Reecer Creek. These sections are still included in the new proposed Project so potential impacts to steelhead remain.

State listed wildlife that may occur in the Project area include golden eagle, northern goshawk, sage thrasher, and loggerhead shrike. The initial environmental impact analysis determined that potential impacts to these species would be minimal and include the basic impacts discussed for birds (mortality, disturbance/displacement, and possible loss of habitat). The current proposal, which has fewer turbines and occupies a smaller area, may further reduce the potential for these impacts. For example, loggerhead shrike and sage thrasher are possible breeding residents in the study area and would occupy shrub-steppe vegetation. The new proposal reduces impact to shrub-steppe by approximately 8 acres thus reducing the potential for impacts to these species.

REFERENCES

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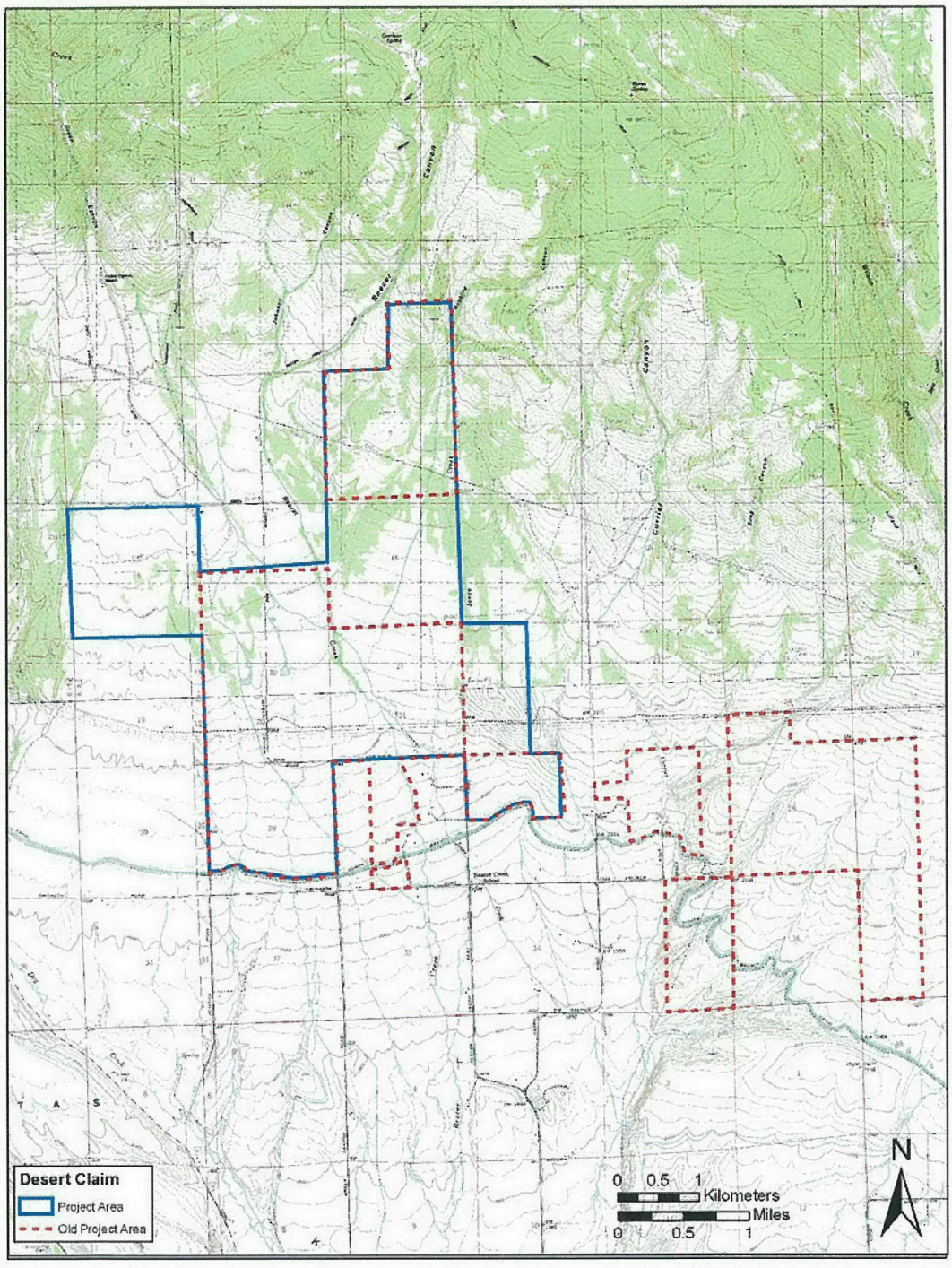

Figure 1. Comparison of the previous Desert Claim project area considered in the DEIS and the new project area.

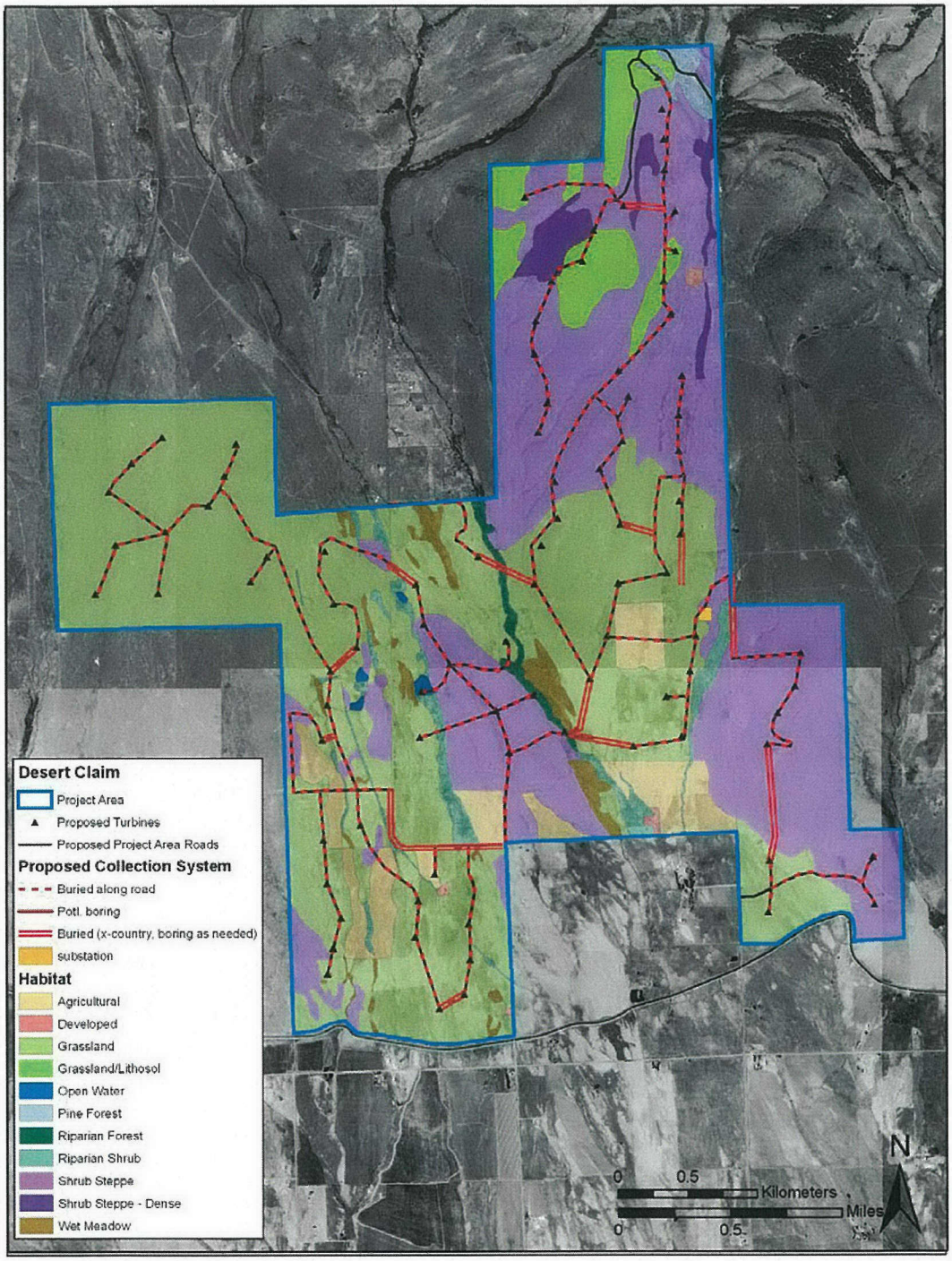

Figure 2. New Desert Claim Project Area Layout and Vegetation. Some of the new areas added require additional ground-truthing.

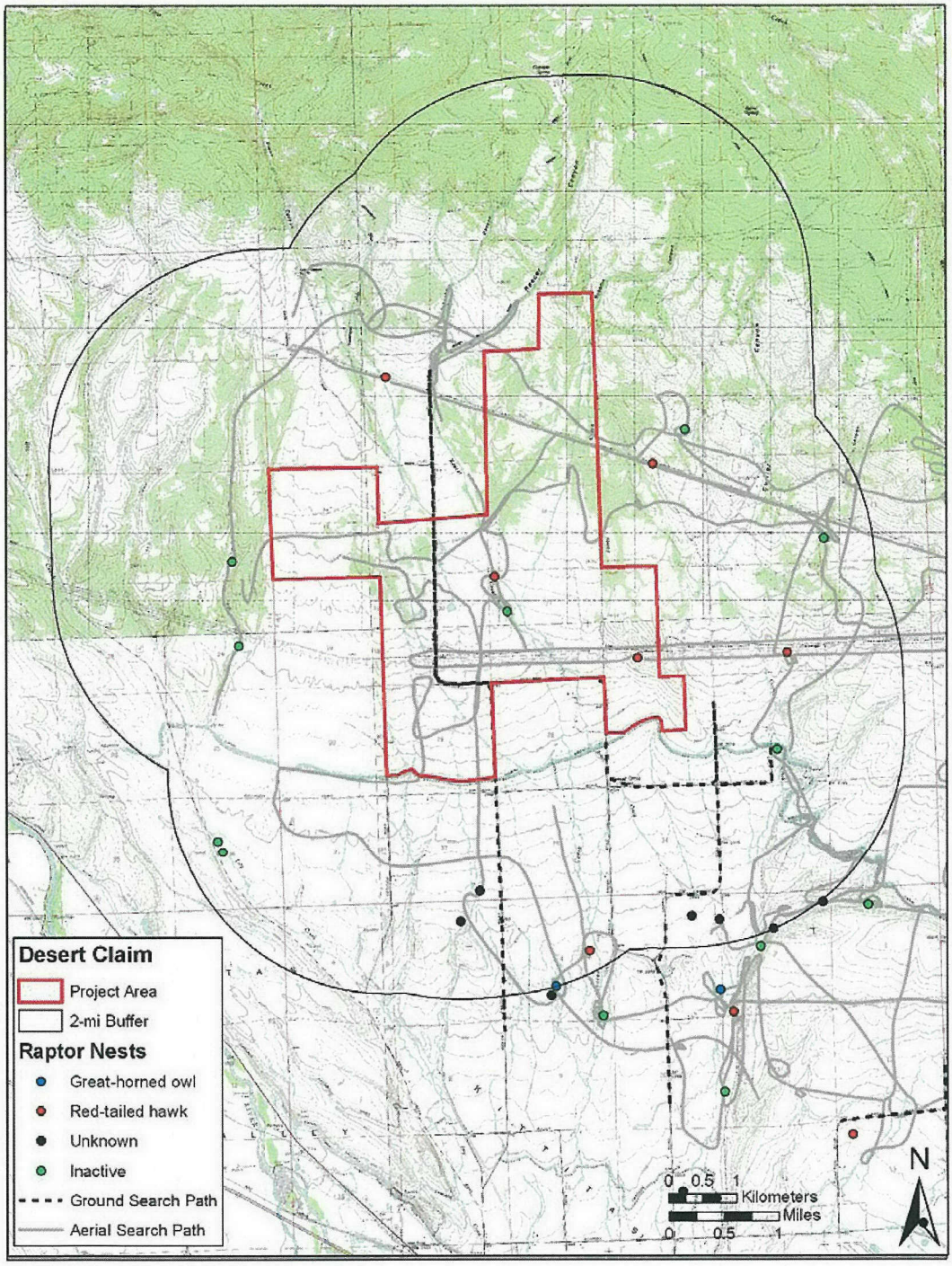

Figure 3. Raptor nest survey in relation to new project area.

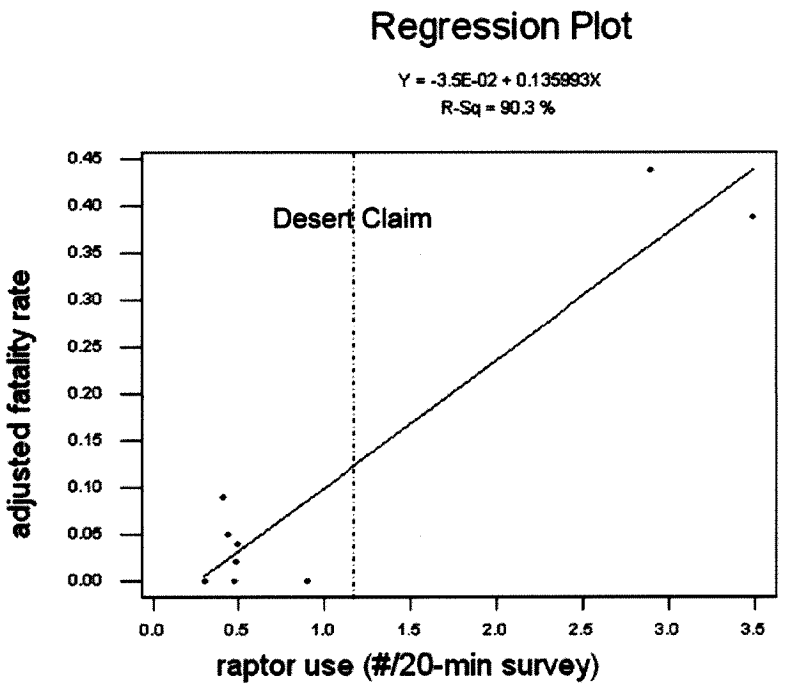

Figure 4. Relationship between raptor use and adjusted fatality rates for 9 newer wind projects.