NOTES | Tuesday, 9/24/2007
Altamont Pass Wind Resource Area Scientific Review Committee Conference Call

Prepared by the Center for Collaborative Policy
Reviewed Final SRC Approval 12/21/07

Agenda Items

AWI Black Blade Painting Study Sample Size
Lockdown Effect on Seasonal Shutdown

SRC Consideration of AWI Black Blade Painting Study Sample Size

Related Materials

AWI Draft Black Blade Study Plan 8-21-07 (P47)
P57_Julie Yee: Power Analysis to Determine Sample Size for Blade Painting Study, 9/16/07
P57b Yee Calculation of stat power for blade painting (9/18/07).pdf
M16d Yee analysis of shutdown effect when blades lock (9/17/07)
M16e Yee analysis of shutdown effect when blades feather (9/17/07)
M16f Yee Summary of Filtered Fatality Data
P60 Smallwood Dissenting Opinion AWI Blade Painting Study (10/2/07)

SRC Recommendation: Sample Size= 135 in control group and 170 painted turbines

The SRC discussed the sample size for the AWI blade painting study during its 9/18/2007 conference call. After that discussion, SRC member Julie Yee agreed to conduct an additional power analysis assuming a 4-month winter shutdown by the other wind companies and an additional power analysis for the combined four focal raptor species. After discussing the power analyses, all the SRC members agreed to recommend 135 turbines in the control group (unpainted) and 170 painted turbines as the sample size for the AWI black blade painting study. AWI will now work with consultant Lee Neher to assign turbines to the sample using a two-layered stratification process, which considers string length (short, medium and long) and topographical features (ridges and valleys). This process will support a scientifically credible study.

Although the larger sample size (150/250) might be preferable, the work required to paint 50% more turbines does not yield that much more confidence in the data or statistical power to merit the amount of work necessary. Also, AWI clarified that it would probably not be possible to paint all those towers by spring 2008 as is currently planned for the 135 turbines. Painting 200 turbines would likely take until June, and then the busy wind season begins.

Over-dispersion should fall somewhere between 1.0 and 1.5 (10 and 15 on the chart since decimal was left out). Julie Yee presented power calculations based on 1.0, 1.3, 1.5, and 2.0 and recommended using 1.3 for sample size determination (13 on the chart). Julie assumed a total sample size (# of turbines × # of monthly surveys) on the basis that the study would begin in July 2008 and end November 2009.

Including the 42 Turbines that are Already Painted

AWI already has 42 turbines in the Altamont Pass Wind Resource Area that have one blade painted black. As part of clarifying the sample size recommendation, AWI asked if the 42 turbines would be part of the 170 painted turbines. The SRC responded that the treatment would need to be in rows or strings and randomly stratified. The rows or strings would be selected as part of the stratified random selection process to be developed by Lee Neher. Currently painted turbines that were not within rows or strings selected during this process could not be used in the study. Individual turbines placed arbitrarily (non-randomly) would confound the study because of difficulty in isolating the effect of treated turbines that are intermixed with control turbines in the same string. Thus, AWI may have to relocate some of those already painted turbines to selected rows or strings. The study needs to be able to determine the effect of the painted blades. The best way to do this is for the painted turbines to be in rows and be randomly selected. AWI will work with Lee Neher on populating the sample and then determine what turbines have to be moved.

Data Control & Management

The monitoring team will monitor the painted turbines and collect the data for the turbines in the AWI study. The MT will make the data available to AWI and the SRC for analytical purposes. AWI stated that they would then like to analyze the data. The SRC raised concern that scientists would question the validity of this analysis and might perceive it as biased. The SRC believes that an independent team, such as the monitoring team, needs to conduct the analysis. The County clarified that the permits require independent monitoring and analysis. The SRC concurs that independent monitoring and analysis is critical. AWI can also conduct analyses; however, for the purposes of the SRC, an independent analyst will be necessary.

Winter Shutdown Exemption Request

As part of the AWI study design proposal, AWI required that it be exempt from the winter shutdown called for in its permit for three years in exchange for designing and implementing the blade painting study. This is significant because granting the exemption reduces the number of turbines being monitored in the Altamont-wide monitoring program and could potentially reduce the possibility of achieving the 50% reduction in mortality. The decision on whether to exempt AWI from the winter shutdown is up to the County of Alameda Planning Department, which holds the permits, and ultimately, the Board of Supervisors. However, the County welcomed discussion and input from the SRC on granting the exemption. 433 of AWI's 920 turbines are included in the Altamont-wide sample.

The SRC approved the study design for black blade painting, but did not vote on the wintertime shutdown exemption. The County requested that the SRC provide input on the exemption. SRC members acknowledge the tradeoff associated with the winter shutdown exemption is significant and would prefer that those turbines stay in the shutdown experiment. Thus, the SRC wants the County to recognize that there's a potential downside to the study, which is that the wind companies will be less likely to reach the 50% reduction if the exemption is granted, because there's no winter shutdown effect for those turbines. One member did not support approval of the blade painting study due to the effect of this tradeoff and said he would prefer the County require the shutdown over the blade painting study because of the known effect of the shutdown. This member viewed the proposal as a package and could not separate the issues including sample size, control and analysis of data, and the winter shutdown exemption for all AWI turbines.

Another suggested that the companies may not be able to achieve the 50% reduction even with the four-month winter shutdown and that this is the only other mitigation strategy that has any promise of success. At least two SRC members question the long-term viability of blade painting because it may not be applicable to large turbines installed through repowering. Blade painting itself may decrease mortality, which may compensate for AWI's lack of winter shutdown.

One member summarized the dilemma in terms of comparing the known short-term effect of shutdown on reducing mortality, albeit below the 50% level, with the longer term potential benefit of learning new information about the blade painting that could contribute to further reducing mortality. She framed this as a dilemma for the County: which is more important or critical? Recognizing the potential limits on repowered turbines, one member reminded us that repowering could be 10-15 years away and blade painting could potentially serve as an effective mitigation before then. No one will know the potential of blade painting until the study is complete.

A final challenge is that AWI holds the patent for any blade painting scheme. No one is able to know whether other companies will even be able to use the patent should a blade painting effect be determined.

Public Comment

No other comment.

Lockdown Effect

M16b Yee: Analysis on Shutdown Effect Using Poisson Model (9/13/07)
M16d Yee analysis of shutdown effect when blades lock (9/17/07)
M16e Yee analysis of shutdown effect when blades feather (9/17/07)

As part of the winter shutdown, Julie Yee conducted some analyses on the effect of locking down turbines so the blades are unable to move when not producing power. When turbines are unable to lock down and the turbines rotate slowly in the wind, Julie Yee (See 16d) observed that burrowing owls appear to have higher fatality counts when the turbines are locked down. The other three target species appear to fare better with lower fatality counts. To determine annual fatality rates combined across the target raptor species, she added together the projected annual fatality rates of the four individual species. When she compared the combined rate based on no winter shutdown with the rate based on a 4-month winter shutdown, the difference is not that great. This is primarily due to the

effect of burrowing owl counts experiencing an apparently opposite effect from counts for the other species.

Another member observed that everyone needs to be cognizant of differential effects on individual species that may require a targeted approach for some species. For example, burrowing owls may require habitat mitigation or some other management strategy since strategies effective for the American kestrel, golden eagle and red-tailed hawk may not prove effective for the burrowing owl.

The shutdown effect is clearer and more effective for the turbines that spin slowly while not generating power. For turbines that spin slowly while not generating power, the shutdown effect appears to substantially reduce mortality for red-tailed hawks and kestrels. For those that lockdown, the effect is more complicated.

Next Conference Call

Tuesday, Oct 16, 2007, 9:30-11:30 Pacific Time (12:30 in NJ)

Participants

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