

MEMO

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Topic: Discussion of Smallwood P161 Paper “Assessment of three Proposed adaptive Management Plans for Reducing Raptor Fatalities in the Altamont Pass Wind Resource Area”

The intent of this paper is to expand or modify SRC member Shawn Smallwood’s paper referenced above. While Shawn admitted that the quantitative analysis and base assumptions are crude and need much revising (last part is my determination) the underlining concept in his paper is a fair one to investigate. There is significant disagreement between the settlement parties involved on how the 50% reduction mortality is to be measured and his approach should be investigated. Shawn’s approach, which expands on Julie Yee’s, is to shift the “baseline” to include the current study years of 2005-2009 and measure mortality reduction on a three year moving average basis.

His approach starts with the new baseline and makes modifications to measure the effects of those mitigations to be completed based on the different schedules presented by the settlement parties in their adaptive management plan proposals. The paper then lists the percent reduction in mortality between the new baseline and the January 2010 – January 2013 period. My analysis below will expand and simplify this approach.

Most of the mitigation efforts including universally shutdown, HRT removals, and unproductive turbine removals were started beginning in late 2007. While Shawn’s analysis used the January 2010 to January 2013 period as comparison, I believe it would be interesting to see what the effects of comparing the new baseline to a 3 year period including bird years Oct 2007 – September 2010 would be. This period would already have incorporated the mitigation actions to date. This is a conservative approach since the mitigation actions, seasonal shutdown, HRT removals, and unproductive turbine removals have been executed throughout this new period and thus the effects would not be fully seen in an average of the Oct 2007- September 2010 period.

I have kept this analysis at a very simplified level that can be reproduced by others and quite admittedly the analysis is crude. The intention here is not to arrive at a definitive result but to demonstrate a different type of analysis. I have listed the assumptions I used in developing the new baseline of 76.9 fatalities per year below.

- NextEra fatalities only
- Fatalities from monitoring team database through Oct 09
- Used 4 bird years from Oct 2005 to Sept 2009
- Filter fatalities for distance (>125M), no WRRS except GOEA, no incidentals, Cause of Death as 1,6,7 (as designated by MT), and four focal species.
- Removed Diablo fatalities (since mitigation measures do not effect Diablo)
- Since the intent is trend analysis and not absolute mortality I used only one scaling factor for the filtered fatalities. In March of 2007 approximately 557 turbines were added to the sample set of 2165 turbines. The filtered mortality from Oct 2005 to February 2007 was scaled up to represent the addition turbines that were monitored from March 2007 to

current. Removing these scavenging and searcher detection factors is a conservative approach since the search interval has been trending down since 2005 and thus made the older results even higher.

Bird Year	2005-2006	2006-2007	2007-2008	2008-2009	Average
Filtered Fatalities	51	115	60	40	66.5
Scaled and Filtered Fatalities	64	127	60	40	72.9

Table 1 – New Baseline

Unfortunately comparing the new baseline to the three bird year period of Oct 2007-Sept 2010 involves some assumptions. At this point the mortality data from January 2010 to May 2010 has not been QA/QC'd by the MT but it should not deviate too significantly. Another important assumption that only time can verify, was the same fatality rate from June 2009 to September 2009 was used for June 2010 to September 2010. Granted, this may not prove out to be true, it does represent the current trend for the last 1.5 years. Filtered fatalities (very limited filtering was done due to the lack of certain information) from Oct 2009 to May 2010 equaled to 73, extrapolating out to the full year would total to 109.5 fatalities. Table 2 represents the fatalities in the new Oct 2007-September 2010 period.

Bird Year	2007-2008	2008-2009	2009-2010	Average
Filterd and Scaled Fatalities	60	40	30	43.33333

Table 2

Average mortality has gone down from 72.9 fatalities per year to 43.3 in the most recent three year period or a reduction of 40.5% without any further mitigation or the fact that many of the implemented mitigations were done progressively from 2007-2009. It is important to note that NextEra does not believe the reduction goal of 50% was meant to be analyzed over an extend period of time that does not incorporate all mitigations, but puts aside that argument at present. For example, if all the companies agreed to shutdown and remove all turbines in Jan 2012, if your period of analysis started Jan 2010 it would take until Jan 2014 for the average mortality to be a 50% reduction (2 years of 100%, and 2 years of 0%). This is a flawed methodology to actually measure a reduction and is prohibitively conservative. If current mortality rates hold for the 2010-2011 period as they were from 2008-2010 than the percent reduction from the new baseline to the 3 year Oct 2008 – September 2011 period would be a 52% reduction without any further mitigation going forward.

I will not attempt to measure the effects of any of future mitigations or the continuation of the current ones as the analysis becomes more complicated than I can represent. But it should be noted that the repowering as stated by NextEra which represents about 15% of the MW capacity

in the Altamont, removal of additional HRTs, and removal of Unproductive turbines should easily result in a mortality reduction of greater than 50%.

In summary this paper expands on Shawn Smallwood's attempt at measuring the effects of mitigation going forward. While we do not agree with a number of the assumptions, we believe that it presents an interesting concept for analysis mortality reduction in the Altamont. We believe that NextEra has done its share to reduce mortality in the Altamont and is continuing to do so with the 2011 repowering effort that is in process now. Should results from that project go well we will repower our remaining assets.