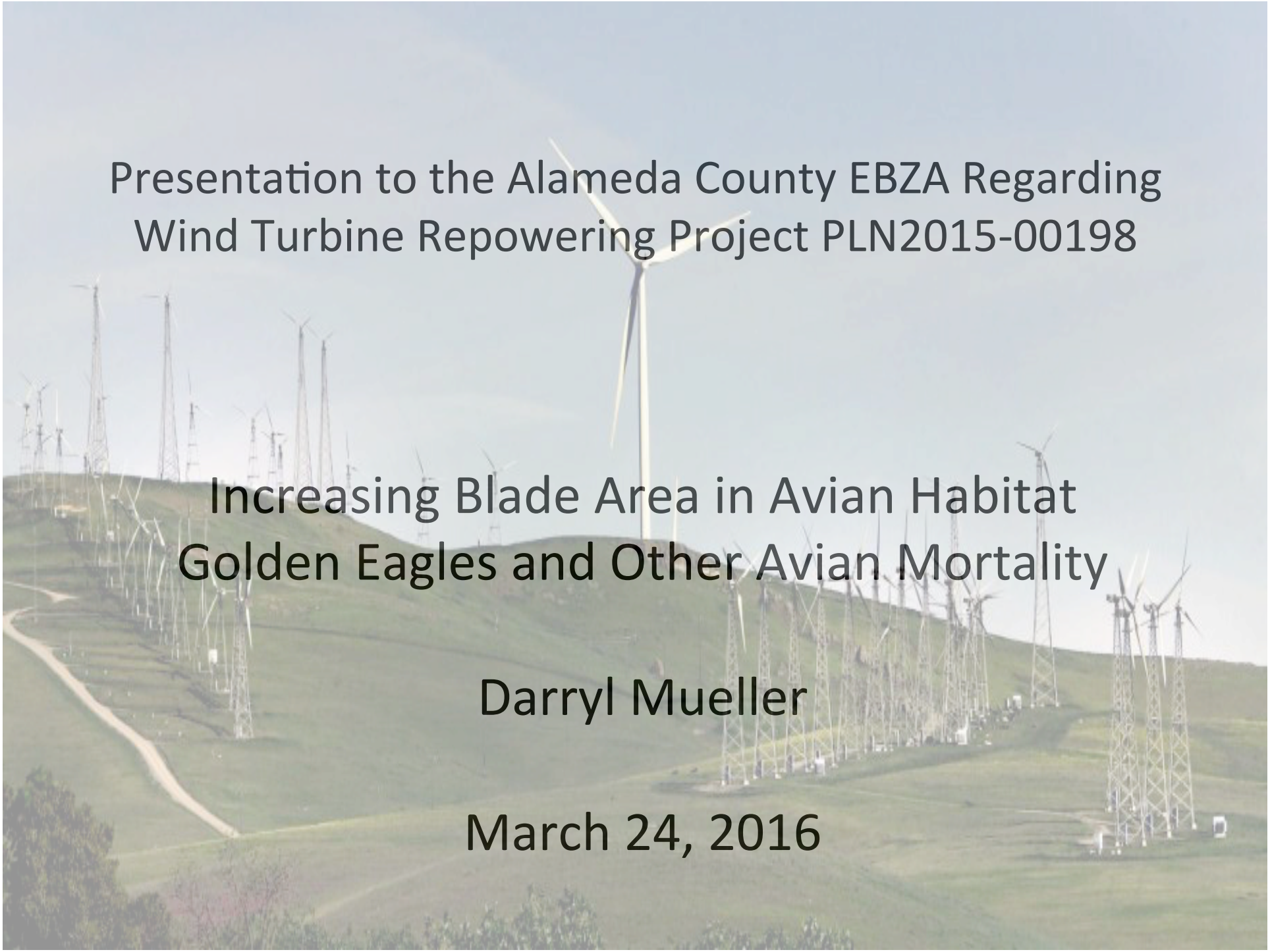


Presentation to the Alameda County EBZA Regarding Wind Turbine Repowering Project PLN2015-00198

Increasing Blade Area in Avian Habitat
Golden Eagles and Other Avian Mortality

Darryl Mueller

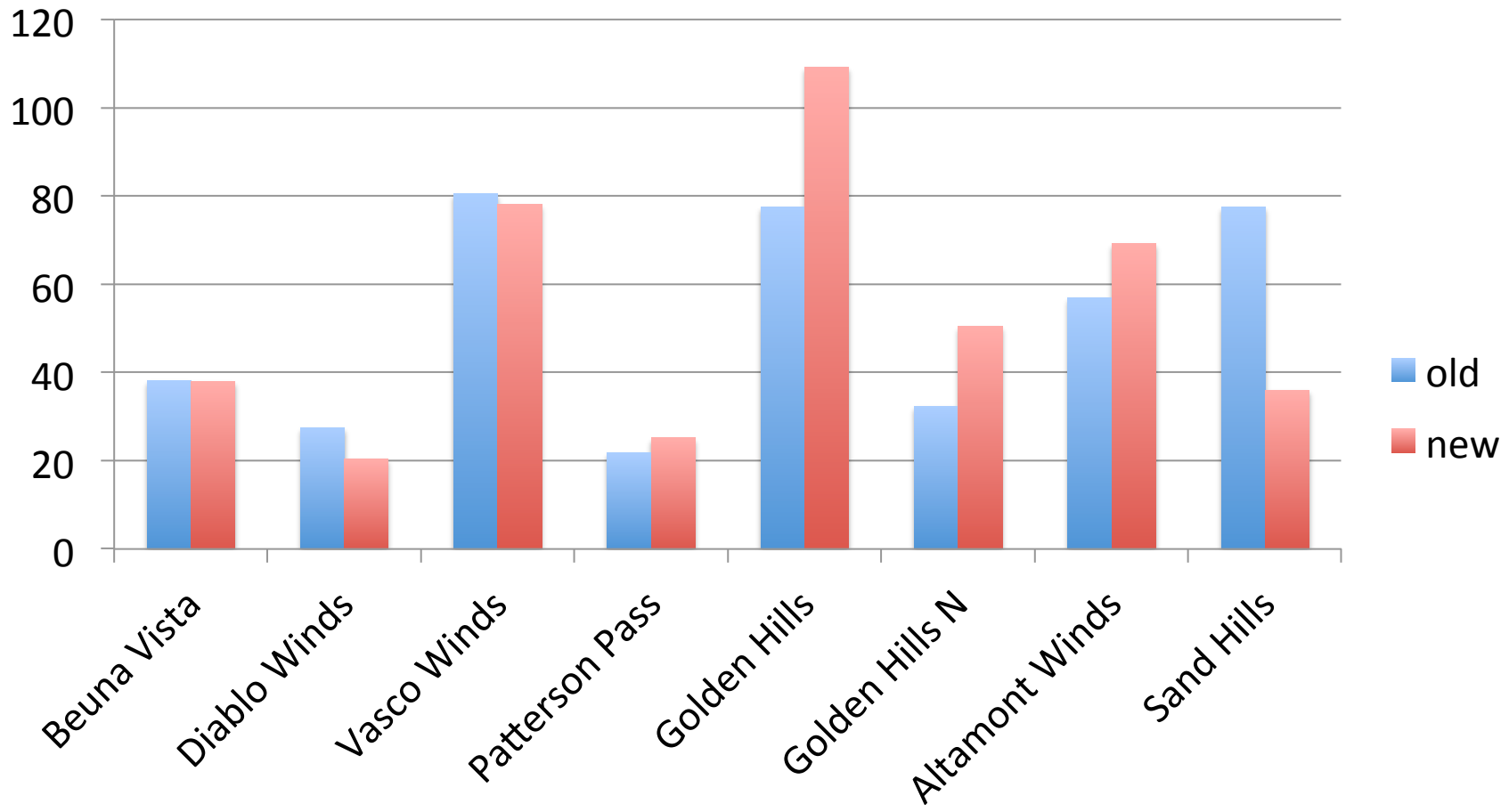
March 24, 2016

Repowering was supposed to
"Replace With Same Blade Sweep"
Diablo Winds - Vasco Winds - Buena Vista did that!

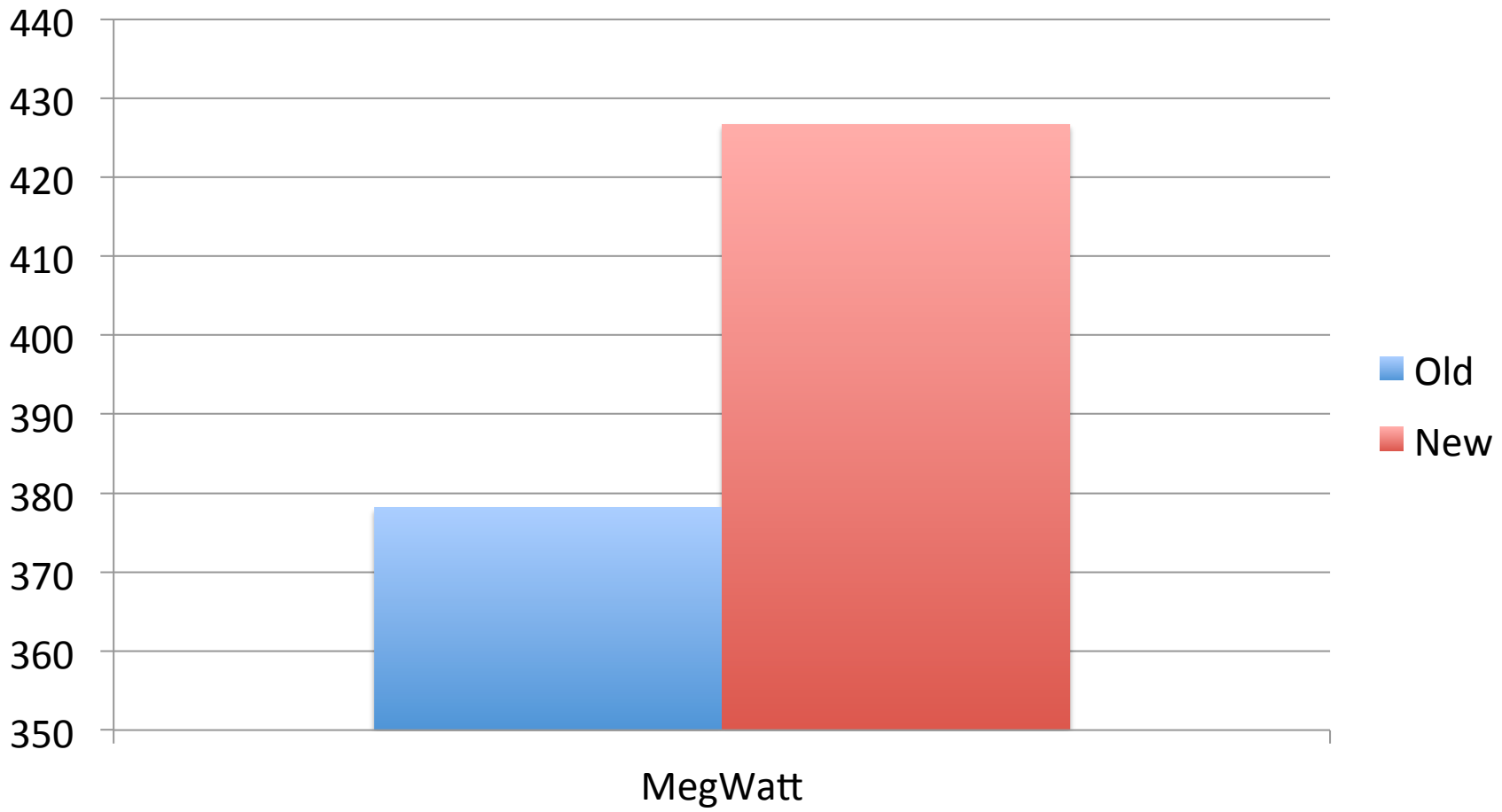
New Re-Powering Increased the Killer Blades Patterson Pass, Golden Hills, Golden Hills North,

Altamont Winds, & Sand Hill!

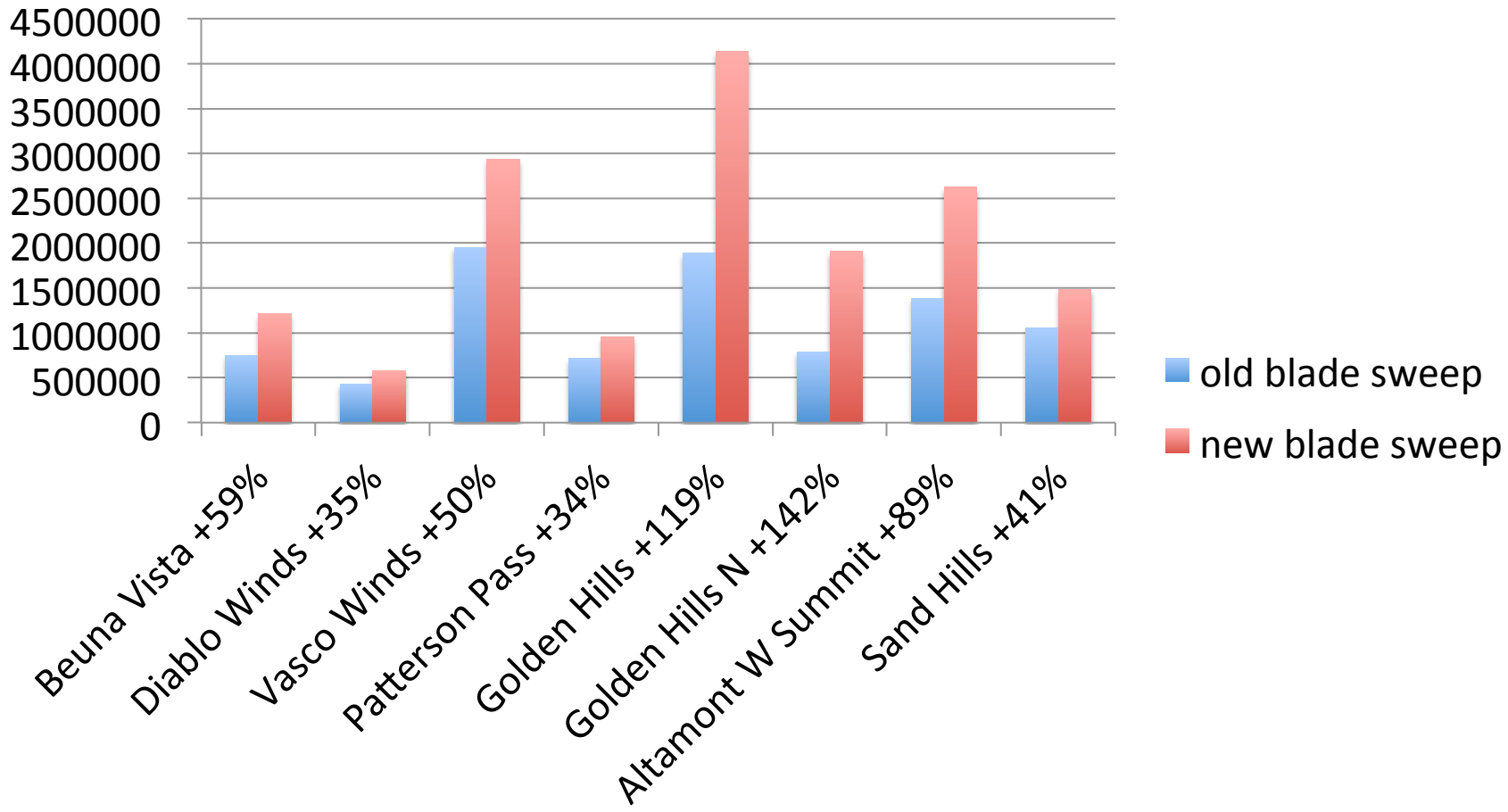
Meg Watts decrease Sand Hill



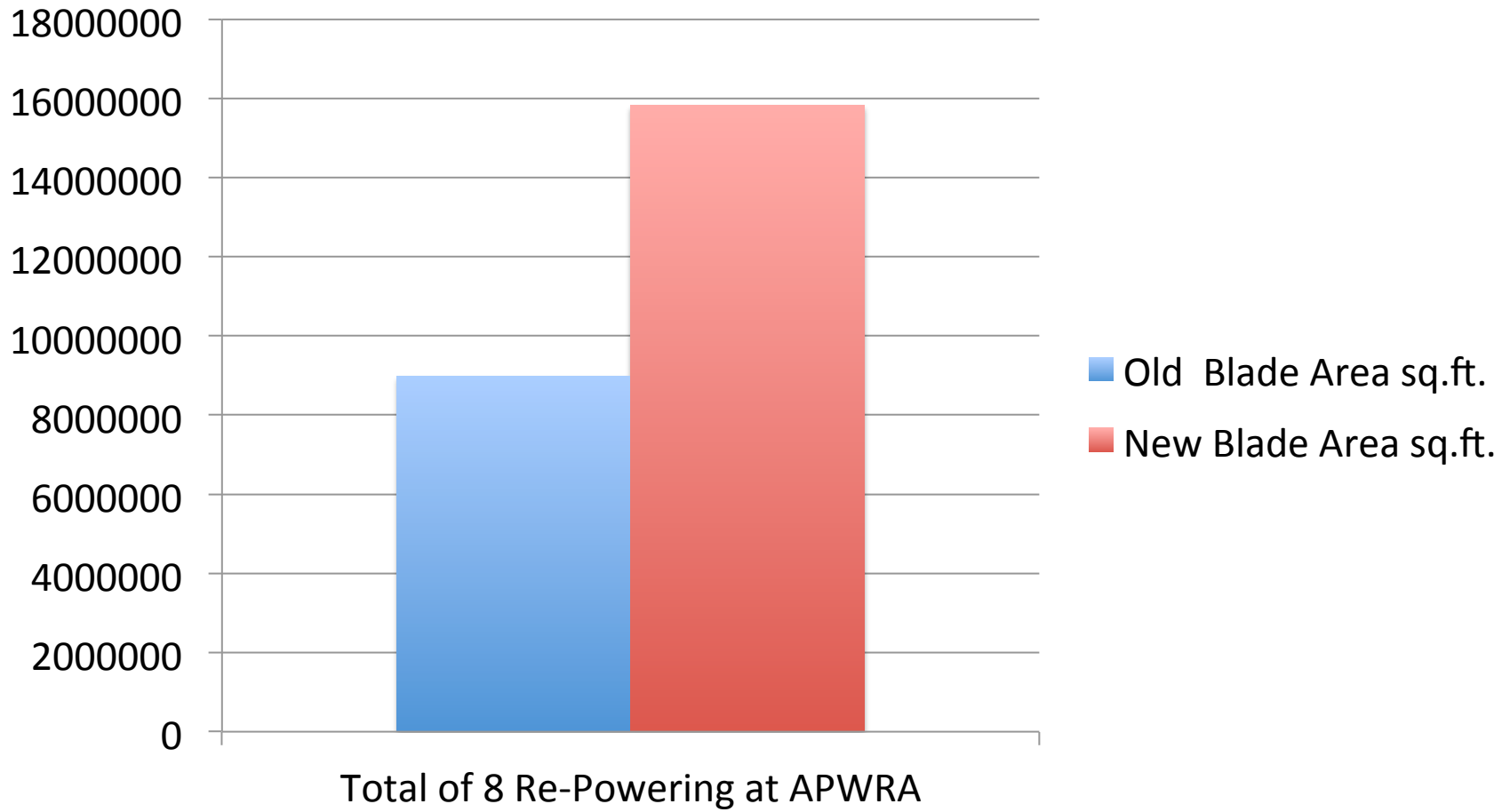
All Repowering Meg Watts 13% increase



Sand Hill is a 41% increased in blade sweep



Total APWRA Re-Powering adds 97 Extra Industrial Wind Turbines = 76% expansion



Favourable population/species Conservation Status FCS

- 1.The population does not continuously decrease.
- 2. There exist sufficient area of habitats necessary to maintain stable population.
- 3. The range (breeding and non – breeding) does not decrease continuously.
- Mortality caused by collisions and loss of habitats are key in terms of likely adverse effects on birds populations.
- Monitoring (after-construction monitoring) Monitoring shall include a 1 – year cycle replicating the pre – investment monitoring and shall be repeated three times during the 5 - year period after the wind farm is commissioned.
- Implementation of measures mitigating the observed effects (species – oriented mitigating measures, for instance: modifications to turbines'night lighting system, change in structure of land use, temporary shutdown of wind turbines.
- Poliish Government Guidelines for assessment of wind farms impact on birds March 2008
- http://www.darrylmueller.com/poland.pdf

3 dimensional aspects or volume in cubic feet of air space occupied up by a turbine blade would contribute to blade strike mortality.

- Old blades were 18 in.+-, new blades can be 5+ times thinker this adds collision!
- This fact multiplies strike opportunities for raptor strike of the 3 dimensional blade. Please watch the video, next slide
- .

during the time it takes a bird to fly through. Rogers et al. (1976) provide a potentially useful formula for calculating the probability of collision assuming no avoidance.

$$Prob = \frac{N(R)\,(D)}{Va}$$

where:
- Prob = Probability of collision
- Va = the bird's axial velocity (m/s)
- N = Number of blades
- R = Blade rotational speed (rps)
- D = Average depth of blade (m)

This calculation is only useful in analyzing the probability that a moving blade will strike a bird but cannot be used for the reverse situation which may also occur. It does, however, point out the potential importance of rotor solidity in avian collision rates.

The Slow Blade Illusion kills!

50% Mortality Reduction Goal?

- Sand Hill has increased the blade sweep, (killing potential) by 41%. Increased tip speed to 191 mph and cannot reduce mortality 50%
- APWRA Repowering Blade Sweep 76% Expansion
- Look at completed projects Shiloh as what we can expect 12% annual mortality Golden Eagles.
- Less Avian through attrition does not reduce mortality

Attrition of 57.9 percent arising from this singlemortality agent, turbine blades

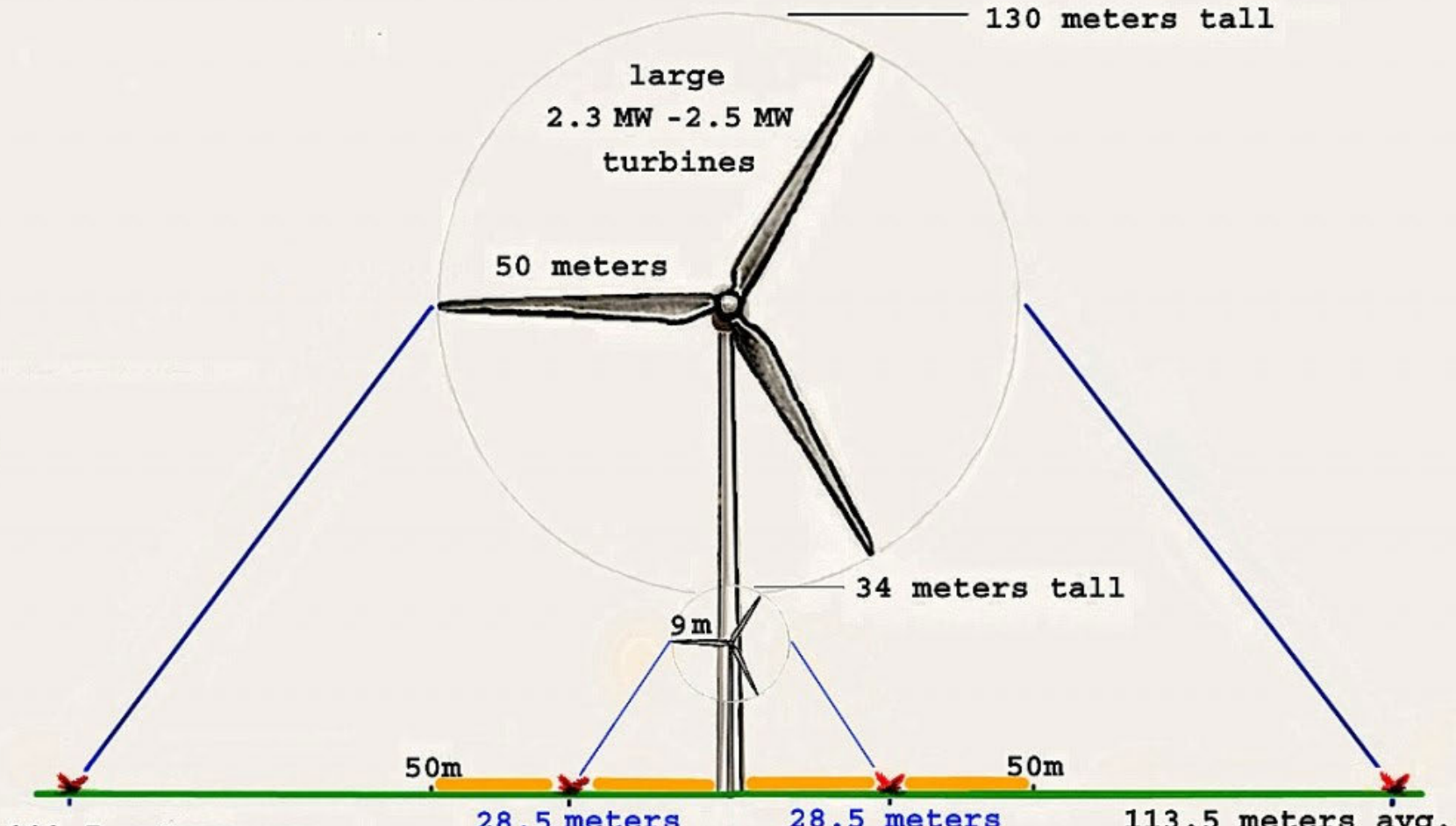
- Unlike juveniles, radio-tagged subadults and floaters are highly vulnerable to turbine blades.
- We recorded 31 blade-strike fatalities (20.0 percent) within our sample of 155 subadults withworking radios and 8 such fatalities (14.8 percent) among 54 floaters. We attribute this susceptibility both to their frequent occurrence in the WRA and their greater tendency, compared with juveniles, to hunt live prey.
- We tagged 25 fledgling eagles in 1994, and a year later, six of these had died or disappeared (emigration plus radio-failure), leaving 19 in the study area as first-year subadults. From January 1995 to November 1999, turbine blades killed 11 of these eagles (including censored ones), an attrition rate of at least 57.9 percent arising from this singlemortality agent.
- Golden Eagles In A Perilous Landscape: Predicting The Effects Of Mitigation For Wind Turbine Blade-Strike Mortality. 2002
- http://www.energy.ca.gov/reports/2002-11-04_500-02-043F.PDF

Turbine Eagle Fatalities at 42%

- Another reason to think that locally produced eagles are at greatest risk is that more than 80% of those that PBRG tagged as free-ranging non-breeders showed evidence of residency in the Diablo Mountains a finding consistent with other studies reporting the tendency of golden eagles to gravitate to natal regions (see Kochert et al. 2002 for review).
- At least 68% of 100 fatalities recorded among 257 radio-tagged eagles during 1994–2000 were humanrelated; turbine blade-strikes accounted for 42% and electrocution for 12%. An additional 21% of fatalities of unknown cause likely included some human-related events, e.g., lead and other poisonings.
- The Trend Of Golden Eagle Territory Occupancy In The Vicinity Of The Altamont Pass Wind Resource Area: 2005
- http://www.energy.ca.gov/2006publications/CEC-500-2006-056/CEC-500-2006-056.PDF

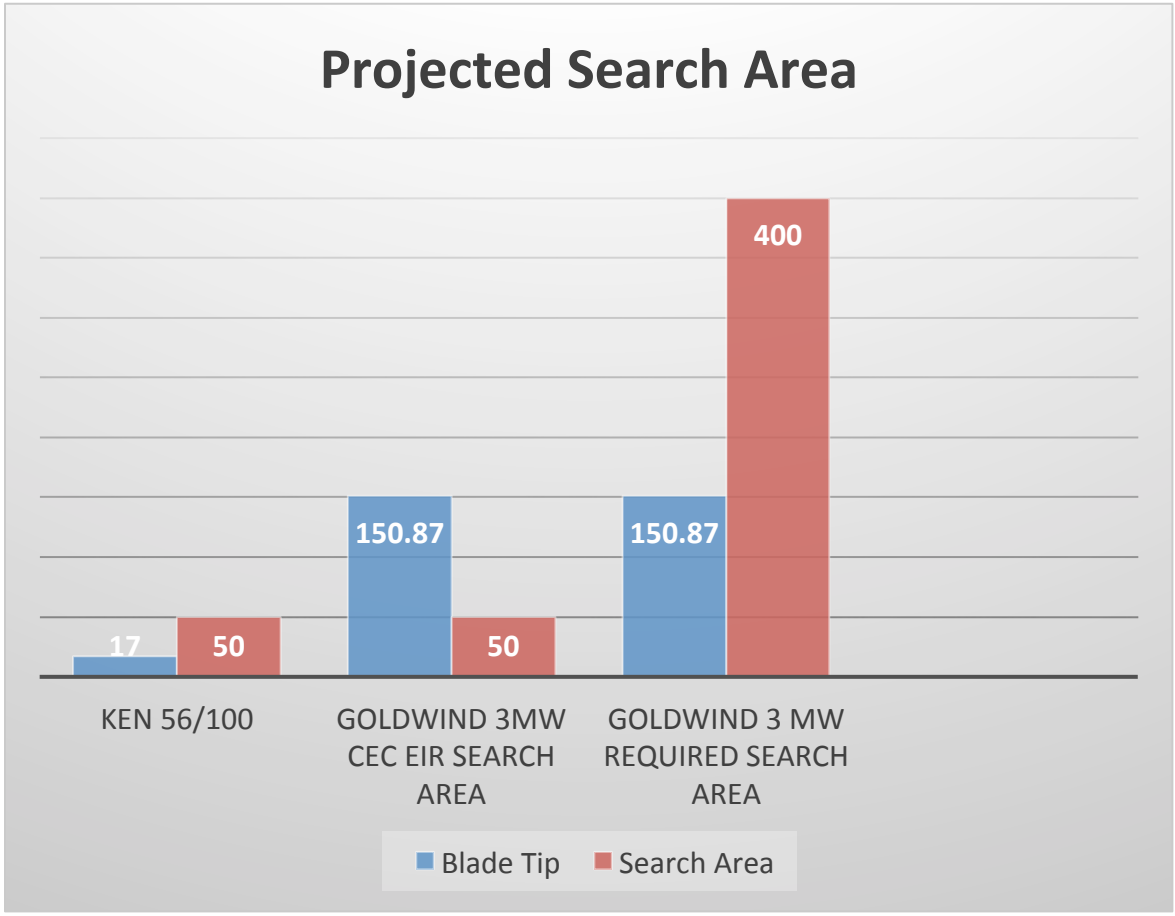
HIDING WIND TURBINE MORTALITY

Wind industry studies deliberately use 50-60 meter mortality search areas on their large turbines so their studies will miss most of the fatalities



This is why search areas should be 200 meters

Comparison of Search Area in Relation to Early Searches



Alameda County Follow Through

- The East County Board of Zoning Adjustments unanimously approved a conditional use permit for Ogin Inc. to build the first phase of 40 shrouded turbines in the Altamont Wind Resource Area east of Livermore.
- **Groundbreaking' Altamont wind turbine project moves forward**
  - "From a study point of view, it's perfect," said independent researcher Shawn Smallwood, who has been counting fatalities for Ogin since 2012. "That corridor is the worst in the Altamont for killing birds." 2014
- **Decision delayed on 'bird friendly' wind turbine experiment for Altamont Pass**
  - The three-member East County Board of Zoning Adjustments on Thursday delayed voting on permits for the 40-turbine Sand Hill Wind project, citing concerns over "limitations" in the project's bird mortality study, the scenic impact of the turbines and the precedent the project could set for the technological future of the Altamont Wind Resource Area. 2014
- "I think we need an experiment, but why does the rest of Alameda County have to see it?" said board member Jim Goff. "We've got so much rural area, I don't know why we have to go through a scenic corridor."

- All that was delivered is the phrase, "Bird Friendly Turbines" that were never delivered and the public thinks the new turbines open blades are "Bird Friendly" that's called bate & switch.

Repowering with more efficient and bird friendly turbines

- it appears that there is a greater risk of fatal collisions with taller turbines. This is a real problem, as larger wind turbines may provide more efficient energy generation. Consequently, it is expected that new wind farms will contain even bigger turbines, which will result in even more bird deaths..
  - (**Reference:** Scott R. Loss, Tom Will, & Peter P. Mara (2013). Estimates of bird collision mortality at wind facilities in the contiguous United States *Biological Conservation, 168*, 201-209 DOI: 10.1016/j.biocon.2013.10.007)

Searches

- The CEC Guidelines (California Energy Commission and California Department of Fish and Game 2007) recommend that the width of the search area should equal the maximum rotor tip height (i.e., the height of the blade tip when positioned at 12 o'clock), to be specified in the project-specific monitoring plan. Poor not enough.
- ERI completely left out 80% search area, to find this you must find 100%. Only after you establish the 100% can search area diameter be found.
- Then Searches must be every 48 hr., see 48 hr. search study. 80% carcass scavenged after 5 days.

Natural factors resulting in low mortality counts.

- When **we** began this study **we** were completely unaware of the extent to which the yearly sum of **WRA** fatalities contributes to the overall death rate of the golden eagle population residing in the region.
- Because of the difficulty of finding dead eagles visually, the large area involved, and the likelihood that carcasses are often scavenged before they are found, a relatively large proportion of total fatalities (from all causes) **are** never found.

- Pilot Golden Eagle Population Study in The Altamont Pass Wind Resource Area California May 1995 http://www.nrel.gov/wind/pdfs/7821.pdf

USFWS Comment 7/24/14 Large Industrial Wind Turbines Killing Exceeding 5% annual. Current Mortality is 12%

(Service 2009). We also put in place measures to ensure that local eagle populations are not depleted by take that would be otherwise regionally acceptable. As described in our *Eagle Conservation Plan Guidance Module 1: Land-based Wind Energy Version 2* (Service 2013, ECP Guidance), it is the Service's policy that take rates for a local-area population (140 miles for golden eagles) should not exceed 5% annually, whether the impacts of a given project have been offset by compensatory mitigation or not, to ensure sustainable populations of eagles.

In our Environmental Analysis for an eagle take permit at the Shiloh IV Wind Farm located about 30 miles from the APWRA (Service 2014), we determined that the current take rate for the APWRA golden eagle local-area population is approximately 12% annually. We are concerned that this level of ongoing take is having a negative effect on the local-area population of golden eagles and could affect the sustainability of this population.

Please contact Heather Beeler, Eagle Permit Coordinator at (916) 414-6651, if you have any questions.

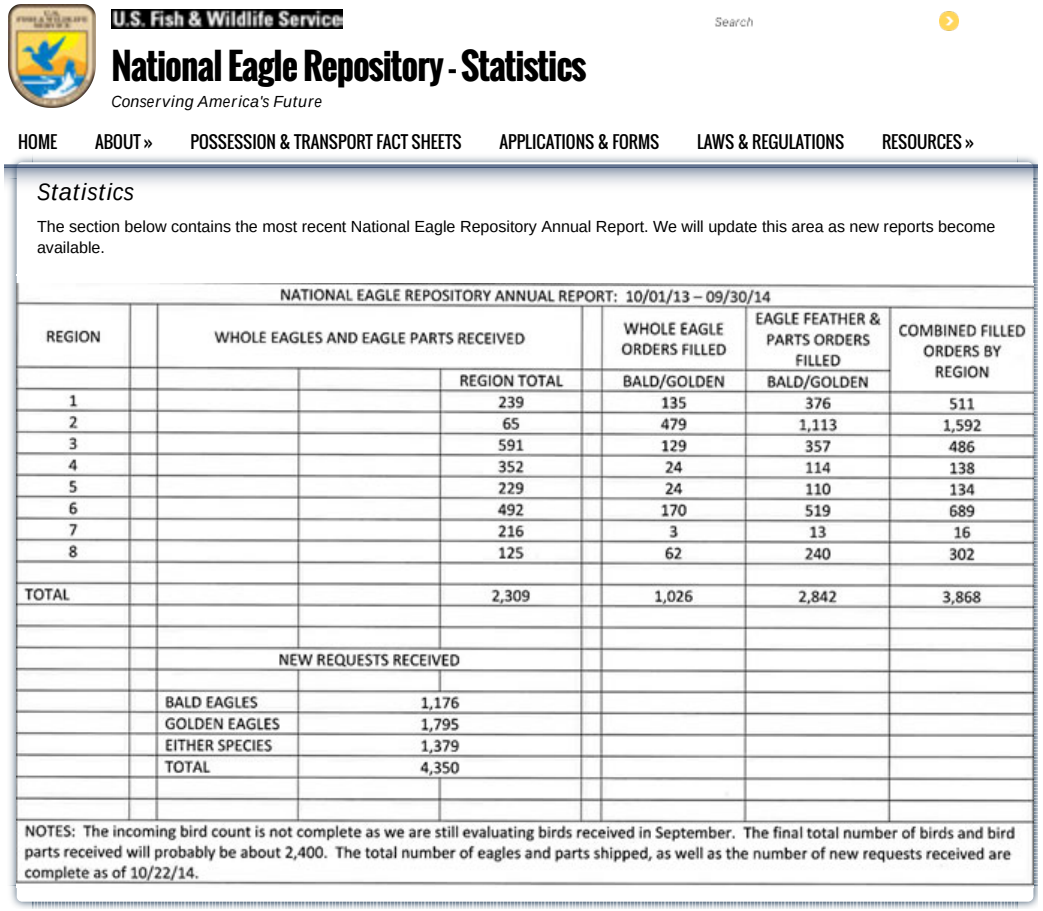
Sincerely,

Based On The Statement from the Department of Justice the wind industry owes Americans billions in fines and is subject to thousands of years of probation for their unpermitted slaughter to protected bird species. Friday November 22, 2014

- "More than 1,000 species of birds, including bald and golden eagles, are protected under the Migratory Bird Treaty Act (MBTA). The MBTA, enacted in 1918, implements this country's commitments under avian protection treaties with Great Britain (for Canada), Mexico, Japan and Russia. **The MBTA provides a misdemeanor criminal sanction for the unpermitted taking of a listed species by any means and in any manner, regardless of fault**. The maximum penalty for an unpermitted corporate taking under the MBTA is $15,000 or twice the gross gain or loss resulting from the offense, and five years' probation."
- **Alameda County & The State of California, & EBRP, LARPD might be considered an accomplice in the fine for knowing that unpermitted killing with the operating permit and having no over sight or complacent in the operation, and receiving revenue from from it.**
- **http://www.justice.gov/opa/pr/utility-company-sentenced-wyoming-killing-protected-birds-wind-projects**

- AGREEMENT TO REPOWER TURBINES AT THE ALTAMONT PASS WIND RESOURCES AREA, #6 12/3/10
- **http://www.darrylmueller.com/Audubon_agreemet.pdf**

USFWS has an Industry to distribute dead eagle parts. Updates ceased, because the industry is hiding facts on the high mortality from the public? Reduced mortality through attrition, as there are less mortality to self report and count.
Wildlife belongs to everyone not just windmill operators. Last update 10/22/14



U.S. Fish & Wildlife Service

Search

National Eagle Repository - Statistics

Conserving America's Future

HOME ABOUT » POSSESSION & TRANSPORT FACT SHEETS APPLICATIONS & FORMS LAWS & REGULATIONS RESOURCES »

Statistics

The section below contains the most recent National Eagle Repository Annual Report. We will update this area as new reports become available.

NATIONAL EAGLE REPOSITORY ANNUAL REPORT: 10/01/13 – 09/30/14

REGION	WHOLE EAGLES AND EAGLE PARTS RECEIVED	WHOLE EAGLE ORDERS FILLED	EAGLE FEATHER & PARTS ORDERS FILLED	COMBINED FILLED ORDERS BY REGION
	REGION TOTAL	BALD/GOLDEN	BALD/GOLDEN	
1	239	135	376	511
2	65	479	1,113	1,592
3	591	129	357	486
4	352	24	114	138
5	229	24	110	134
6	492	170	519	689
7	216	3	13	16
8	125	62	240	302
TOTAL	2,309	1,026	2,842	3,868

NEW REQUESTS RECEIVED

BALD EAGLES	1,176
GOLDEN EAGLES	1,795
EITHER SPECIES	1,379
TOTAL	4,350

NOTES: The incoming bird count is not complete as we are still evaluating birds received in September. The final total number of birds and bird parts received will probably be about 2,400. The total number of eagles and parts shipped, as well as the number of new requests received are complete as of 10/22/14.

USFWS Regional Map, notice that region 8 Calif.& Nev. 125 and region 2 Texas & Oklahoma 65. This could only reflect under reporting, and attrition.

Click on the map (or the text links, below) for the home page of the eight different US Fish and Wildlife Service regions:

Pacific Region (Region 1)
The Pacific Region includes Idaho, Oregon, Washington, Hawaii and the Pacific Islands.
Southwest Region (Region 2)
The Southwest Region includes Arizona, New Mexico, Oklahoma and Texas.
Great Lakes-Big Rivers Region (Region 3)
The Great Lakes-Big Rivers Region includes Illinois, Indiana, Iowa, Michigan, Missouri, Minnesota, Ohio and Wisconsin.
Southeast Region (Region 4)
The Southeast Region includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico/Virgin Islands, South Carolina and Tennessee.
Northeast Region (Region 5)
The Northeast Region includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia
Mountain-Prairie Region (Region 6)
The Mountain-Prairie Region includes Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah and Wyoming.
Alaska Region (Region 7)
The Alaska Region consists of the state of Alaska.
Pacific Southwest (Region 8)
The Pacific Southwest consists of most of these two states, plus the Klamath Basin area of Oregon.
Headquarters, Washington D.C.

Questions? Please try our Search Engine and check out the answers to the FAQ's (Frequently Asked Questions), before you contact us.

Subject: Proof of increased Altamont reported eagle kills
From: "Jim wiegand" <jim@jimwiegand.com>
Date: Mon, 14 Dec 2015 11:13:38 -0800
To: "DarryMueller" <Fax@DarryMueller.com>

In 1988 with 6,062 of the turbines branded in the media, as being so deadly to raptors, **the USFWS reported 29 eagle carcasses killed by Altamont turbines.**

RESOURCE AREA:								
Altamont								
1st Quarter	671,600	17,200	86,378,826	71	6	67*	6,782	162
2nd Quarter	635,090	1,200	294,568,833	63	22	240*	6,613	12
3rd Quarter	652,225	15,800	397,657,941	78	29	711*	6,356	156
4th Quarter	623,400	17,500	135,169,195	115	10	106*	6,062	175
1988 Totals	623,400	51,700	914,174,795	75	17	725*	6,062	505

2013- 2014 eagle carcass numbers given to Jim Wiegand by the USFWS in Oct 2015, 33 and 37 an increase of 28 percent. Keep in mind these eagle fatality numbers are with the new "bird friendlier turbines" that have been installed and large sections of Altamont out of service during this time due to construction.

As quoted from USFWS....."**Below is a monthly break-down for Altamont dating back to 2013 regarding eagle fatalities. I can not guarantee these numbers are exact, but I am confident that they are certainly close. I hi-lited the highest count (June 2014). If Jim W has a particularly month of interest, or identifies a possible shorted count, it is possible we have an independent record further accounted for in a specific INV."**

February 2013: 4
March 2013: 3
April 2013: 3
May 2013: 1
June 2013: 3
July 2013: 2
August 2013: 5
September 2013: 5
October 2013: 6
November 2013: 1
December 2013: 0

33

January 2014: 1
February 2014: 0
March 2014: 4
April 2014: 3
May 2014: 5
June 2014: 8
July 2014: 3
August 2014: 2
September 2014: 5
October 2014: 4
November 2014: 2
December 2014: 0

37

January 2015: 0
February 2015: 2
March 2015: 5
April 2015: 3
May 2015: 0
June 2015: 1
July 2015: 1
August 2015: 3

15 Partial Shut Down South of 580 & H RE-Powr

--Darryl 1988 eagle kills copy.jpg

29 Eagles were killed in 1988

- And 33 Eagles are Killed in 2013
- And 37 Eagles are Killed in 2014
- Do the Math! On the Low Side
- 26 years X 29 = 754 Dead Eagles
- $15,000 X 754 = $11,310,000 and that is only MBTA, BEA has $200,000 & $500,000 along with Prison Time.

Blade Sweep 1-14-16

			ft.		blade area feet	blade area meter	56/100	Rounded	Tip MPH			
USA US Windpower	Kenetec 56/100 kw	17.00	88.00	55.70	2436.70	226.98	1.00	1 to 1	143.10	72.00	50.00	164.04
USA	Flowwind 56/150 kw	17.07		56.00	2463.01	228.82	1.01	1 to 1			50.00	164.04
USA	Flowwind 56/250 kw	18.90		62.00	3019.08	280.48	1.24	1.25 to 1			50.00	164.04
Denmark	Nordtank 65kw	15.84		52.00	2123.72	197.06	0.87	1 to 1			50.00	164.04
Neitherlands	Windmaster 75kw	21.95		72.00	4071.51	378.26	1.67	1.50 to 1			50.00	164.04
Neitherlands	Windmaster 200 kw	21.95		72.00	4071.51	378.26	1.67	1.50 to 1			50.00	164.04
Neitherlands	Windmaster 250 kw	23.16		76.00	4536.47	421.45	1.86	1.75 to 1			50.00	164.04
Neitherlands	Windmaster 300 kw	24.99		82.00	5281.03	490.63	2.17	2 to 1			50.00	164.04
USA Kenetech	KVS-33	33.20	429.78	108.92	9318.27	865.70	3.82	4 to 1	111.93	28.80	50.00	164.04
Danmark	Vestas V47 660 kw	47.00	241.14	154.20	18674.76	1734.95	7.66	7.5 to 1	156.81	28.50	75.00	246.06
Japan	Mitsubishi 1000A	61.40	278.00	201.44	31870.02	2960.93	13.08	13 to 1	204.85	19.50	75.00	246.06
India, Magarpatta	Suzlon S97 2.1 MW	97.00	454.00	318.24	79542.72	7389.83	32.64	32 to 1	185.09	16.30	?	?
China, Bejing	Goldwind GW 121 3MW	121.00	495.00	396.98	123773.64	11499.04	50.80	50 to 1	191.23	13.50	?	?
German, Hamburg	Siemans 2.3 MW	101.00	427.50	331.36	86236.49	8011.87	35.39	35 to 1	189.18	16.00	?	
German, Hamburg	Siemans SWT-2.3MW	120.00	499.00	393.70	121736.76	11309.76	49.83	50 to 1	175.60	12.50	?	
Denmark	Vesta V90-3MW	90.00	410.00	295.00	68349.44	6361.74	27.80	28 to 1	169.47	16.10		

Project Name	CPU #	# to replace	MW	area of sweep	new sweep / old sweep Area Swap	rounded Same Sweep	Area increase	Same as 56/100	Blade sweep meter / per kw	Blade Sweep Ft /per kw	Decrease effectiveness	X increase Blade Kill?	MW increase
Golden Hill North 56/100	PLN 2015-00157	324.00	32.40	789489.39	9.93	10.00			2.27	2.44			
Golden Hill North S97 2.1	PLN 2015-00157	24.00	50.40	1909025.24			1119535.85	783.45	3.52	3.79		142% 1119535.85	18.00
AWI 56/100	PLN 2014-00056	569.00	56.90	1386479.82	17.43	17.00			2.27	2.44			
AWI S97 2.1	PLN 2014-00056	33.00	69.30	2624909.70			1238429.88	1077.24	3.52	3.79		89% 1238429.88	12.40
Sand Hills	PLN 2015-00198	433.00	43.30	1055089.21	8.52	9.00			2.27	2.44			
Sand Hills Goldwind 121	PLN 2015-00198	12.00	36.00	1485283.64			430194.43	609.55	3.83	4.13		41% 430194.43	-7.30
Golden Hills S 56/100	PLN2014-00032	775.00	77.50	1888439.13	23.74	23.00			2.27	2.44			
Golden Hills S97 2.1	PLN2014-00032	52.00	109.20	4136221.35			2247782.23	1697.47	3.52	3.79		119% 2247782.23	31.70
Patterson Pass Nordtank	PLN2012-00214	336.00	21.84	713570.46	8.97	10.00		Nordtank	3.27	3.27			
Patterson Pass S97 2.1	PLN2012-00214	12.00	25.20	954512.62			240942.16	449.45	3.52	3.79		34% 240942.16	3.36
Buena Vista Windmaster 75kw		5.00	0.38	20357.57									
Buena Vista Windmaster 200 kw		129.00	25.80	525225.25				Replacement sweep					
Buena Vista Windmaster 250 kw		30.00	7.50	136094.11				like 284 windmaste					
Buena Vista Windmaster 300 kw		15.00	4.50	79215.44				is same as 284.9					
total		179.00	38.18	760892.38	23.87		4250.80	4250.80	1.89	2.04			
Mitsubishi 1000A		38.00	38.00	1211060.72		24.00	450168.34	284.90	2.96	3.19		59% 450168.34	-0.17
Diallo Winds Flowind 56/150		148.00	22.20	364526.13				replacement sweep					
Diallo Winds Flowind 56/250		21.00	5.25	63400.63				like 229 flowind					
total		169.00	27.45	427926.76	22.91		2532.11	3019.08	1.53	1.64			
Vestas V47 660 kw		31.00	20.46	578917.45		23.00	150990.69	228.63	2.63	2.83		35% 150990.69	-6.99
Vasco Winds 56/100		726.00	72.60	1769041.04					2.27	2.44			
Vasco Winds 33.2/400		20.00	8.00	186365.45					2.16	2.33			
		746.00	80.60	1955406.49	22.67				3.30	3.55			
Siemans 2.3		34.00	78.20	2932040.58		23.00	976634.10		3.48	3.75		50% 976634.10	-2.40
Total Old Windmills		3531.00	378.17	8977293.64	138.06								