

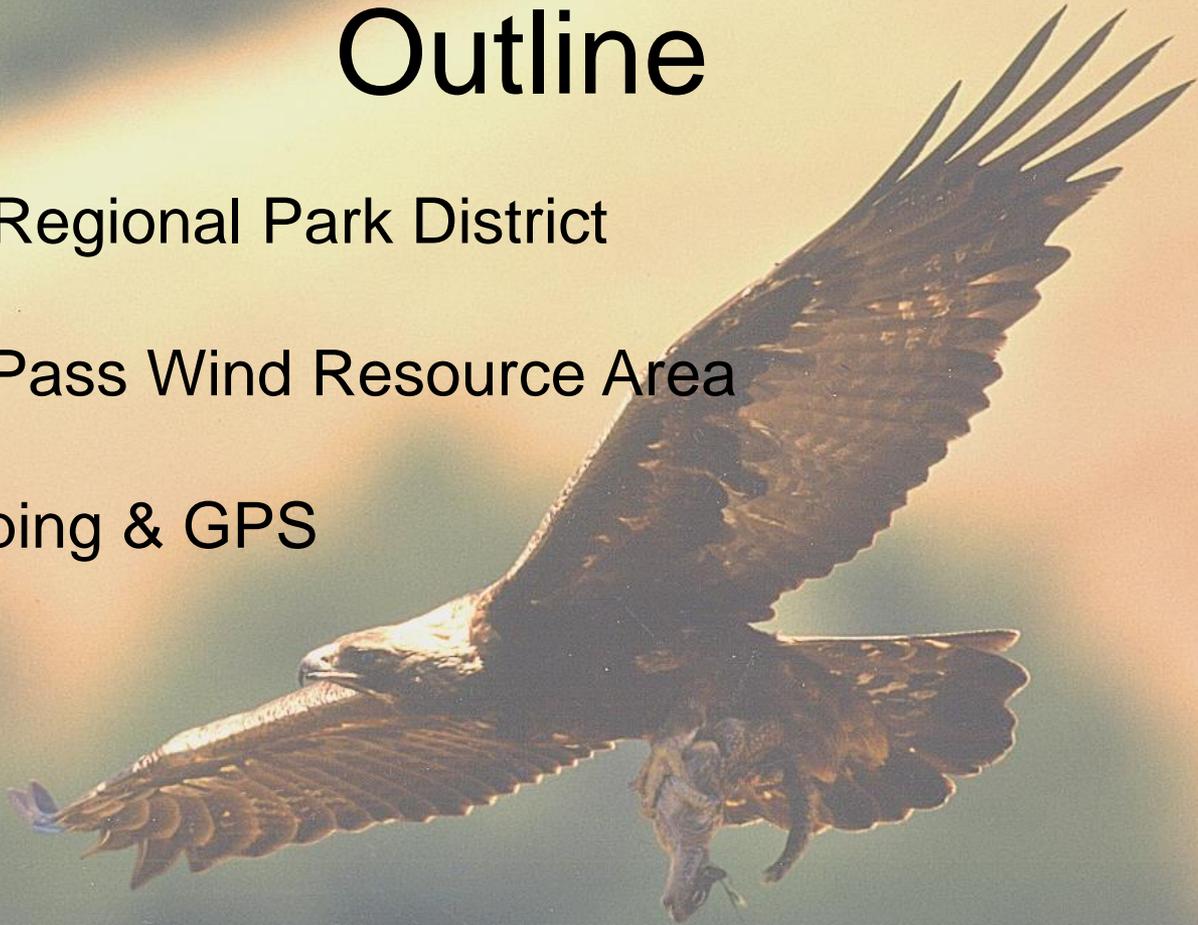
Golden Eagle Research and Management



Douglas A. Bell *et al.*
East Bay Regional Park District

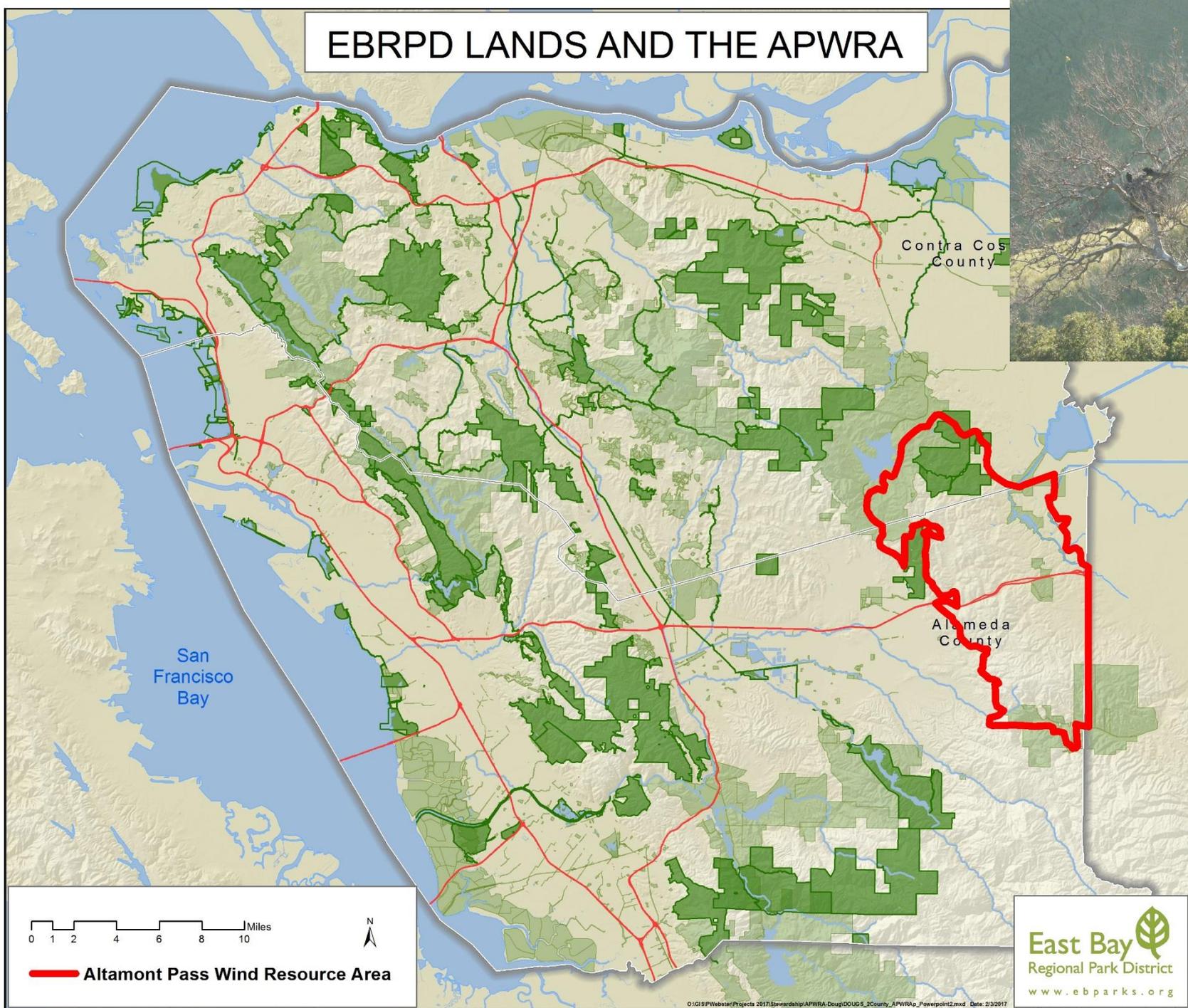
Outline

- East Bay Regional Park District
- Altamont Pass Wind Resource Area
- Risk Mapping & GPS



- Take Permits and Mitigation
- Volunteers

EBRPD LANDS AND THE APWRA



San Francisco Bay

Contra Costa County

Alameda County

0 1 2 4 6 8 10 Miles



 Altamont Pass Wind Resource Area

East Bay 
Regional Park District
www.ebparks.org

Pre-Repowered APWRA

5,000 Turbines

50-70 Annual
GOEA Mortalities



Repowering and Risk Mapping

Flight Behavior

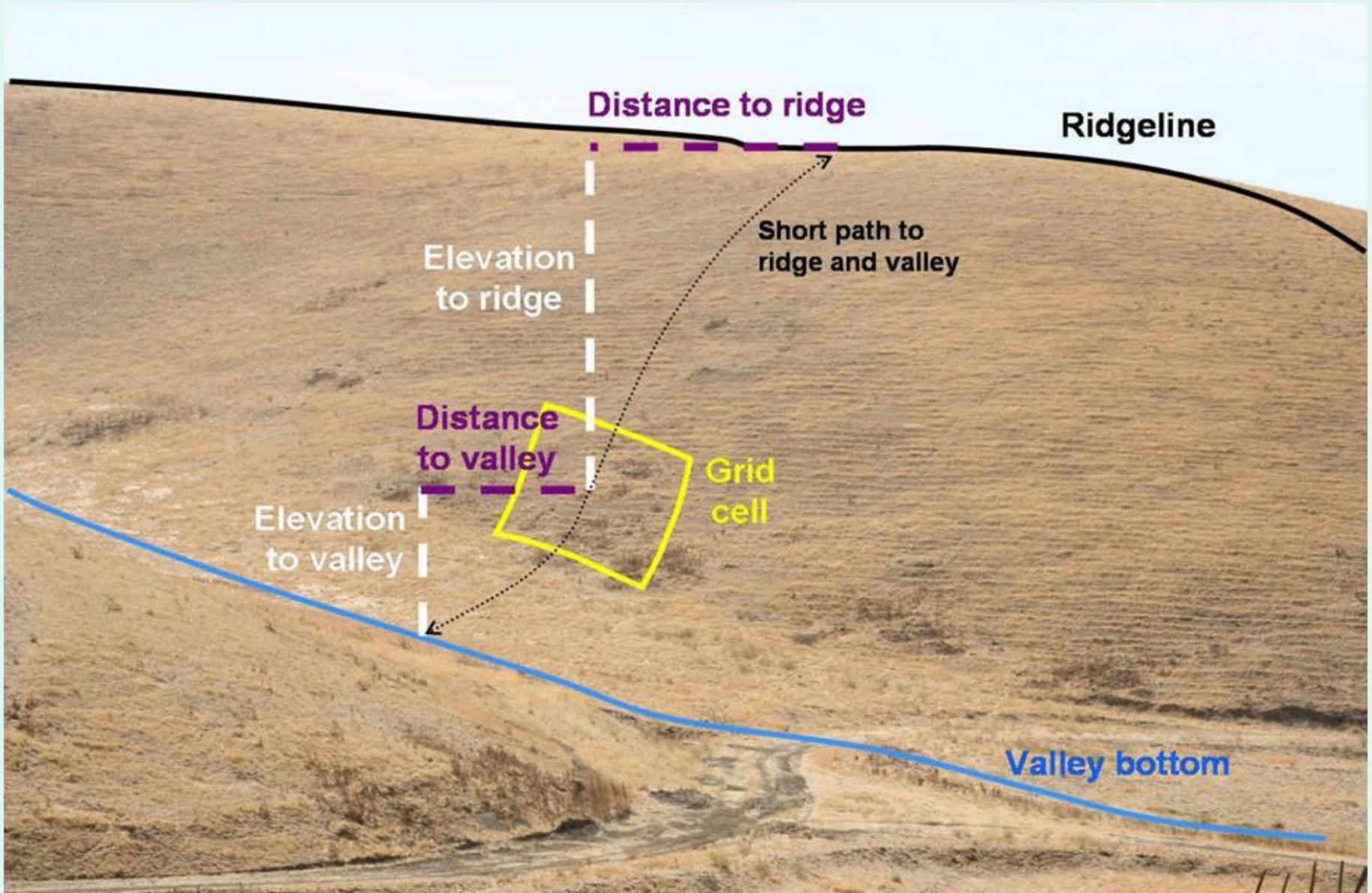


GSM/GPS Telemetry

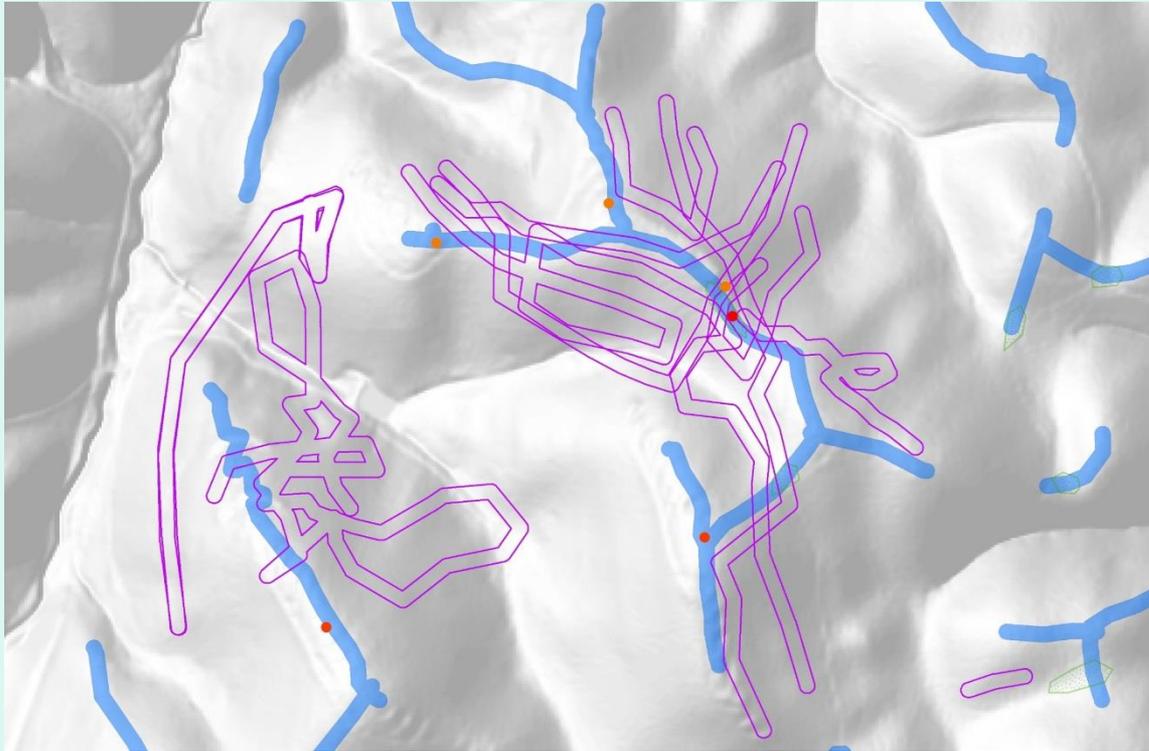


DEM - Grid Cells

5,460,000 grid cells



Flight Behavior Mapping



**Fuzzy
Logic
Model**

**Ridge orientation + Subwatershed
orientation + $2 \times$ Percent up slope +
 $0.75 \times$ Hill size**

GSM/GPS (2012-2018)

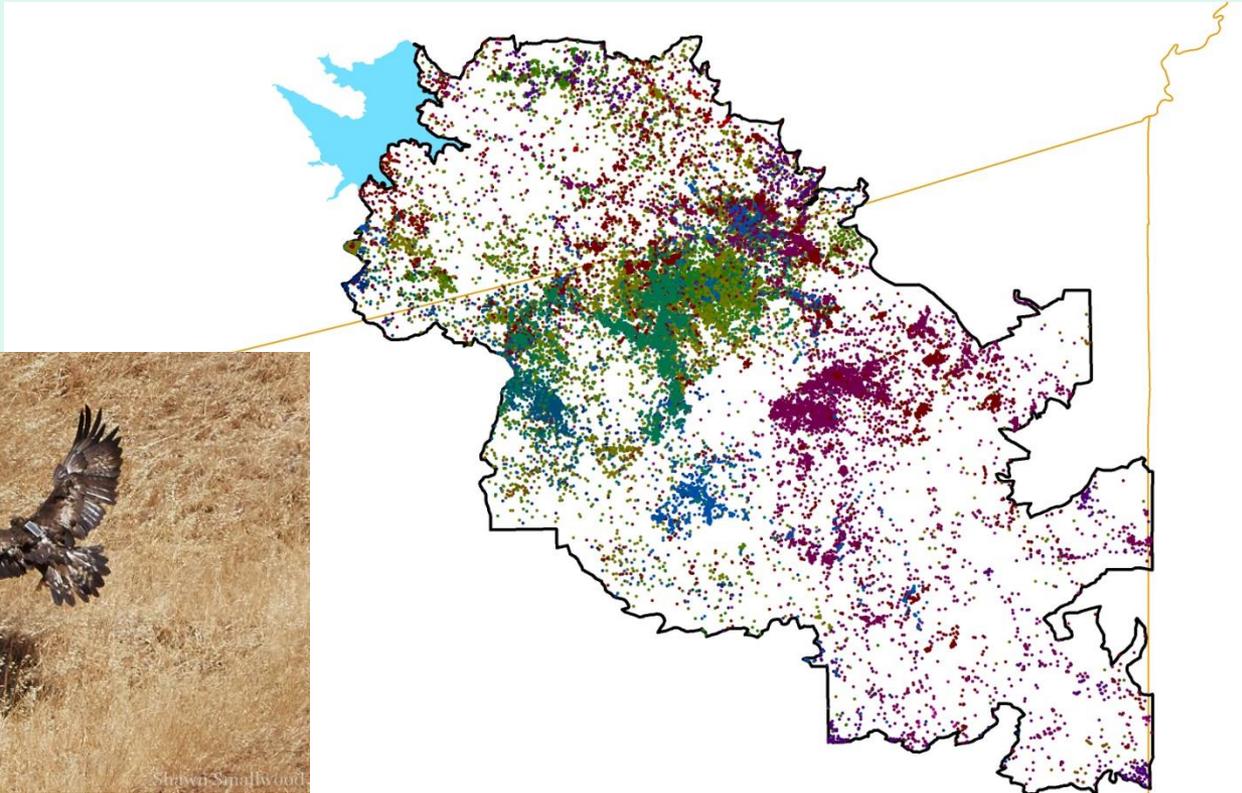


Golden Eagles: 32

Local/Juv	14
Sub-Adults	13
Adults	5



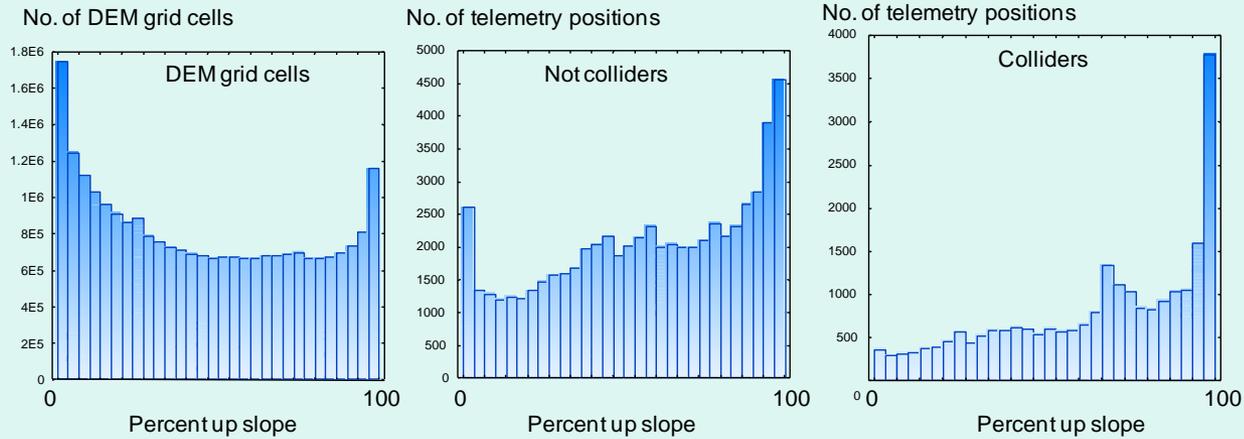
GPS Telemetry & Mapping



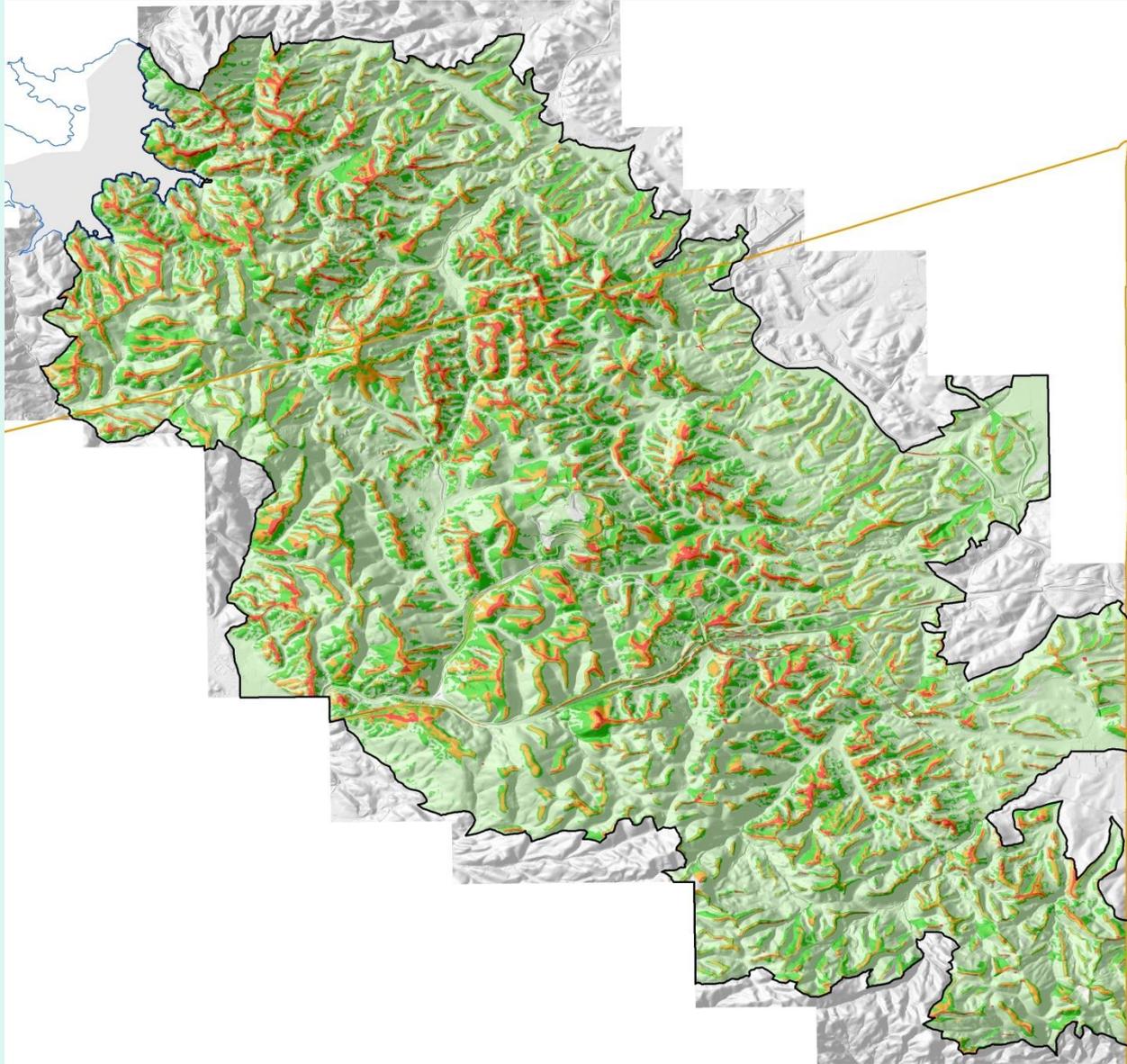
**Fuzzy
Logic
Model**

**Distance to major valley + 2×Percent up slope + 2×
Percent up major terrain slope + Gross slope +
2×Subwatershed orientation + 3×Ridge orientation +
10×Hazard site**

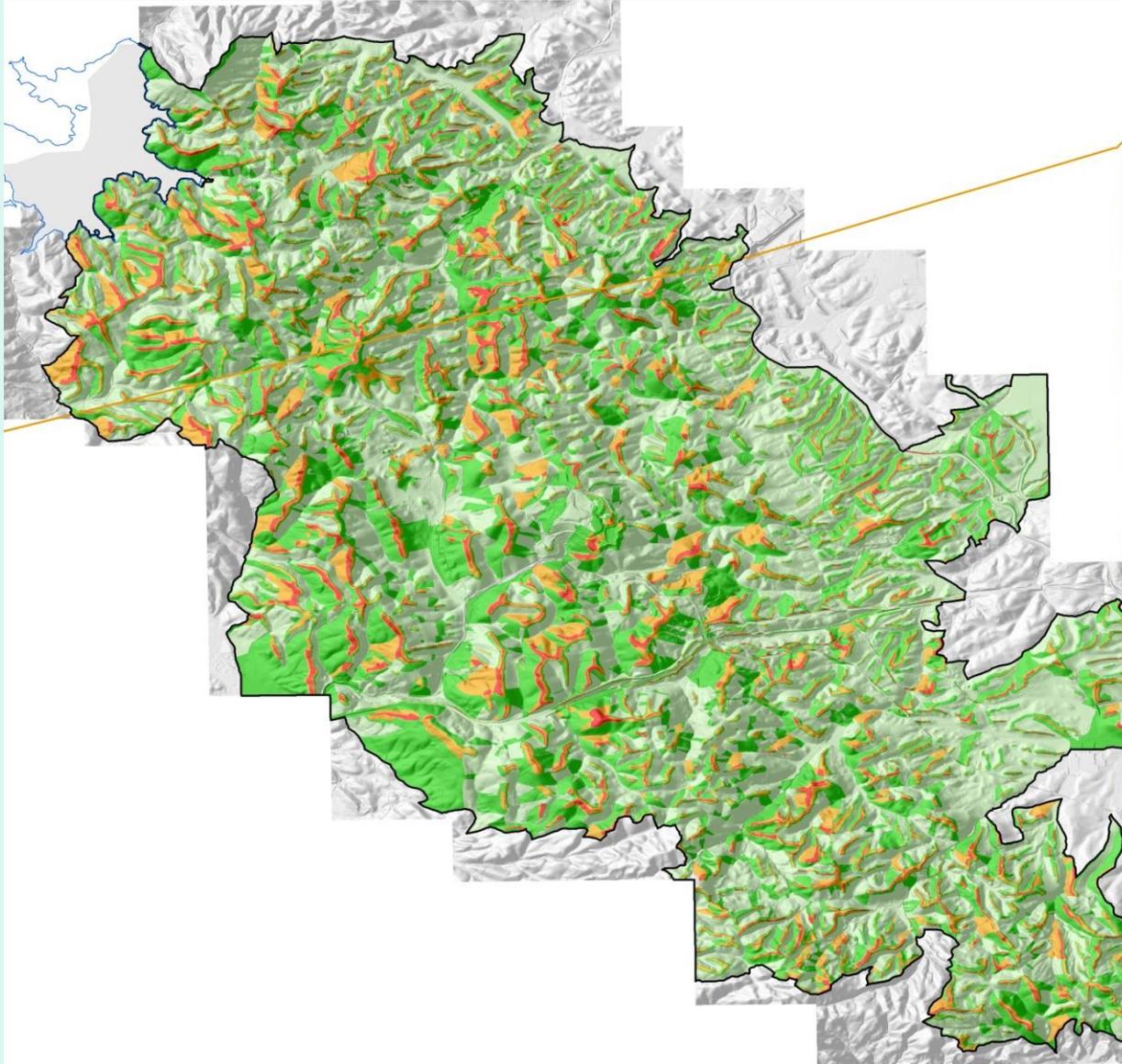
Not-Colliders vs Colliders



Flight Behavior Risk Map



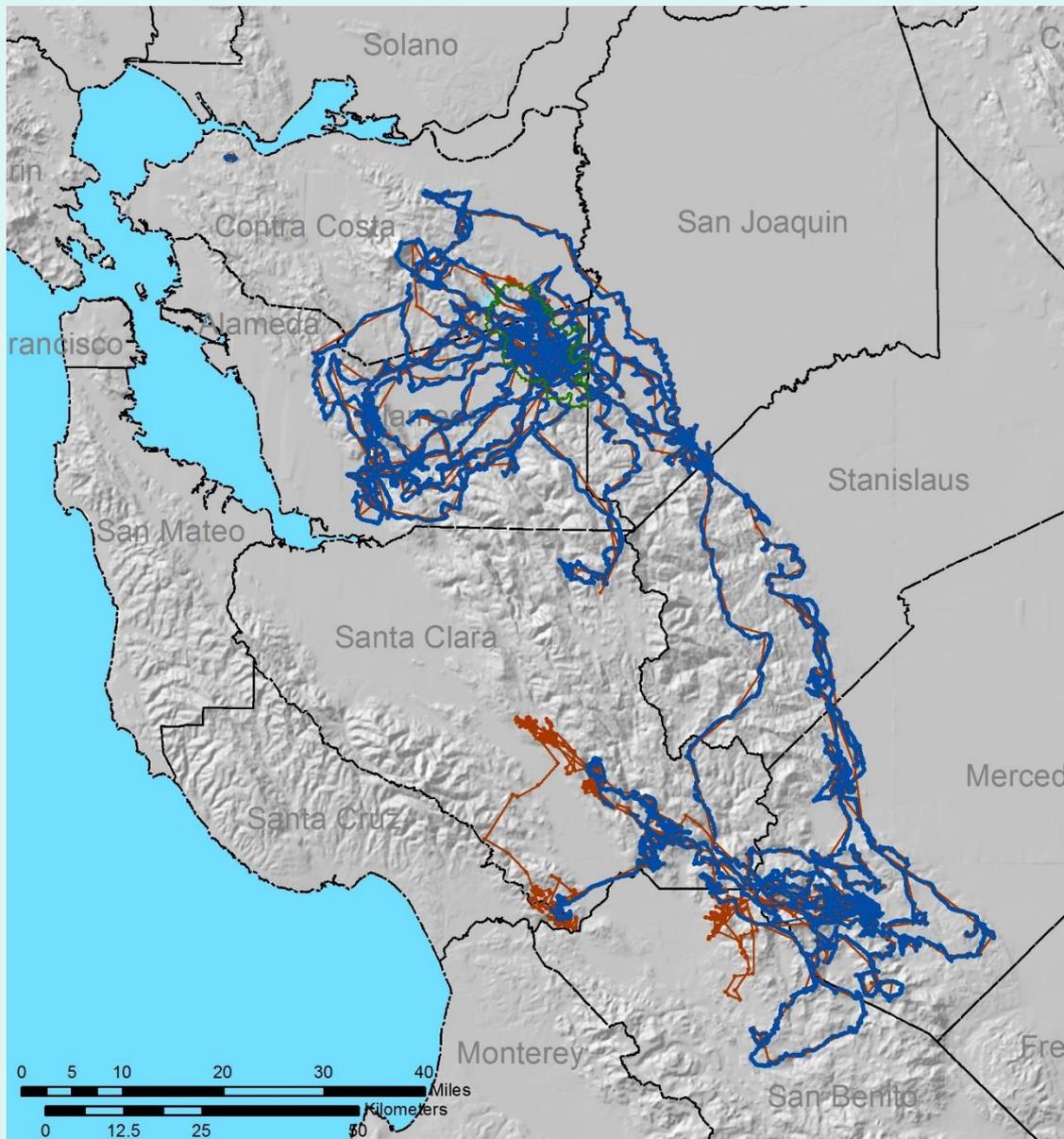
GPS Telemetry Risk Map



Repowering and Risk Mapping

<u>Project</u>	<u>Status</u>	<u>MW</u>	<u>Turbines</u>		<u>Data</u>
			<u>Pre-</u>	<u>Post-</u>	
Tres Vaqueros	Hold	28.8	86	21	U
Vasco Winds	Built	78.1	800	34	U
Golden Hills	Built	87.4	817	48	U, B, F
Golden Hills N	Built	39.2	305	24	B, F
Patterson Pass	Permitted	21.9	337	13	B, F
Sand Hill	Plan	24.1	426	12	B, F, T
Sand Hill	Revised	144.5	671	40	----

Movements & Miscellany



Take Permits and Mitigation



California Ground Squirrel



Eagle Take Permits

Altamont Pass Wind Resource Area

U.S. Fish and Wildlife Service final rule:

On December 9, 2013, the U.S. Fish and Wildlife Service (USFWS) announced a new, final rule for eagle take permits and wind turbines. District staff believes this new rule presents an opportunity for mitigation funding to be directed in a more constructive manner. While the new rule extends the take permit term limit from five to 30 years, it does appear to provide review opportunities every five years. These reviews should include specific criteria for mitigation measures; including funding for research, maintenance, and acquisition of eagle habitat. In addition, many of the wind turbines in the Altamont Pass Wind Resource Area (APWRA) are 30 years old and need to be replaced. Repowering (the process to replace numerous, smaller old wind turbines with fewer, larger new turbines) provides an opportunity to further reduce fatalities by carefully siting the new wind turbines.



District Research:

Current research by District biologists and collaborators is producing risk maps for the APWRA landscape to show locations where eagles demonstrate consistent flight patterns based on topography – areas which should be avoided to the extent practical when siting new wind turbines during repowering. Research-directed mitigation funding needs to be a priority to further develop modelling and mapping to reduce risks to eagles and other species.



Next Steps:

The District stands ready to work with USFWS to develop meaningful mitigation criteria for this take permit program. With decades of experience in researching, monitoring and adapting to the ever-changing conditions of the APWRA, the District possesses a unique understanding of this important interface between migratory birds and wind energy generation.



Sources: ESRI, GDT, USGS

The Chronicle

The District is asking elected officials to support meaningful mitigation measures – research, maintenance and acquisition of habitat – when reviewing wind turbine take permits.

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East Bay
Regional Park District

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