California Guidelines for Reducing Bird and Bat Impacts from Wind Developments

California Department of Fish and Game Workshop

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Dick Anderson

Introduction to the Guidelines

The objectives of the guidelines are to provide information and protocols for assessing, evaluating, and determining the level of project effects on bird and bat species, and to develop and recommend impact avoidance, minimization, and mitigation measures. The guidelines are voluntary and were developed to encourage the development of wind energy in the state while minimizing and mitigating harm to wildlife.

Document Organized Around Five Basic Steps

- Gather preliminary information and conduct site screening.
- Address CEQA, wildlife protection laws and other permitting requirements.
- Collect pre-permitting data using standardized monitoring protocol.
- Identify potential impacts and mitigation.
- Collect operations monitoring data using standardized protocol.

Step 1 – Gather Preliminary Information and Conduct Site Screening

- Experts
- Literature and databases
- Site Visit
- Existing information
- Look for red flags
- Ask the right questions (raptors, special status species, sensitive areas, wildlife attractions, etc.)

Step 2- Determine CEQA and Wildlife Protection Law Requirements

- CEQA
- Fish and Game Code Protection Laws
- Federal Laws
- County or other LORS

Step 3 – Conduct Pre-Permitting assessment

Category 1- Project sites with available wind-wildlife data.

Category 2 – Project site with little existing information and no indicators of high wildlife impacts.

Category 3 – Project sites with high or uncertain potential for wildlife impacts.

Category 4 – Project site inappropriate for wind development.

Study Objectives and Design

- Clear statement of the questions to be answered
- Collect information useful for estimating impacts
- Conduct data gathering using standardized methods when possible
- Consult with appropriate agencies and stakeholders

Standardized monitoring

- Bird Use Counts
- Acoustic Monitoring
- Raptor nest searches
- Metrics

Bird Use Counts

- Modified point count
- Samples- one per 1-1.5 square miles
- 30 minutes per week for a year
- Record species, distance, height, etc.
- Can be modified as appropriate

Acoustic Monitoring for Bats

- One full year if possible
- At least fall and spring migratory seasons
- Two detectors at each sample site (5 meters/30 meters)
- Sample sites- at each met tower as possible

Raptor Nest Searches

- Search during breeding season
- Within one mile of proposed turbine/disturbance
- May need to expand area for large species (golden eagle)
- May contract area for small species
- Conduct searches from air and/or ground

Metrics

- Birds detected per 30 minutes (or per minute)
- Include distance to bird so a metric can be created for birds per minute per 800 meters or per 50 meters or in the rotor swept area
- Bat passes per detector hour or night

Special Studies

- Radar
- Mist netting
- Breeding bird surveys
- Displacement studies
- Mitigation effectiveness
- Special-status species

Step 4 – Assess Potential Impacts and Identify Mitigation Measures

- Avoidance
- Minimization
- Mitigation
- Compensation
- Adaptive management

Step 5 – Collect Operations Monitoring Data Using the Standardized Monitoring Protocol

- BUC
- Acoustic
- Carcass searches
- Searcher efficiency trials
- Carcass removal trials
- Long-term monitoring
- Metrics

Bird Use Counts

- Category 2 and 3 conduct one year of BUC

Acoustic Monitoring

- Not recommended unless determined needed

Carcass Searches

- Category 2 and 3 – two years of carcass searches
- Category 1 – May only need one year of carcass searches
- Year two may be modified based on year one results
- 30% of turbines sampled- varies as appropriate
- Search area equal to rotor tip height (400 ft tall, search area of 200 ft radius)
- Conduct search every two weeks (modified based on carcass removal rate)

Carcass Removal Trials

- Difficult study but very important
- Conduct seasonally during operations monitoring
- Check carcasses everyday for first three days, thereafter, at intervals determined by previous carcass removal trials
- Use fresh carcasses of native species
- Average time for a carcass to be removed

Searcher Efficiency Trials

- Conduct seasonally during operations monitoring
- Use native species
- Conduct trials without searchers knowledge
- Place carcass as dead carcasses are known to look in the field
- Probability of detection

Metrics

- Number of fatalities of birds or bats per MW of installed capacity per year
- Number of fatalities of birds or bats per square meter of rotor swept area per year
- Break out by species and groups of birds/bats

Long-Term Monitoring

- If unexpectedly higher fatalities than estimated
- To develop impact avoidance, minimization, and mitigation measures
- Monitor for mitigation effectiveness
- Monitor for special situation (special-status species)

Standardization

- Always do a standard study and develop standard metrics
- Additional studies can be conducted to supplement the standard studies---such as mist netting, using greater effort during migration time, and other methods and tools as defensible and needed
- Needed for better estimates of impacts
- Meta-analysis is needed to improve estimates

Benefits Of Standardization

- To promote the responsible permitting and development of windplants.
- To provide a reference to assess the suitability of a proposed windplant site and assess the effects of a windplant project on all bird resources.
- To provide sufficiently detailed and clearly understandable methods, measurements and definitions.
- To promote efficient, consistent, cost-effective methods which will produce comparable data.

Objective Of Standardization

To develop metrics and methods which promote consistency and allow comparison between avian field studies relating to wind energy deployment.

Special Case

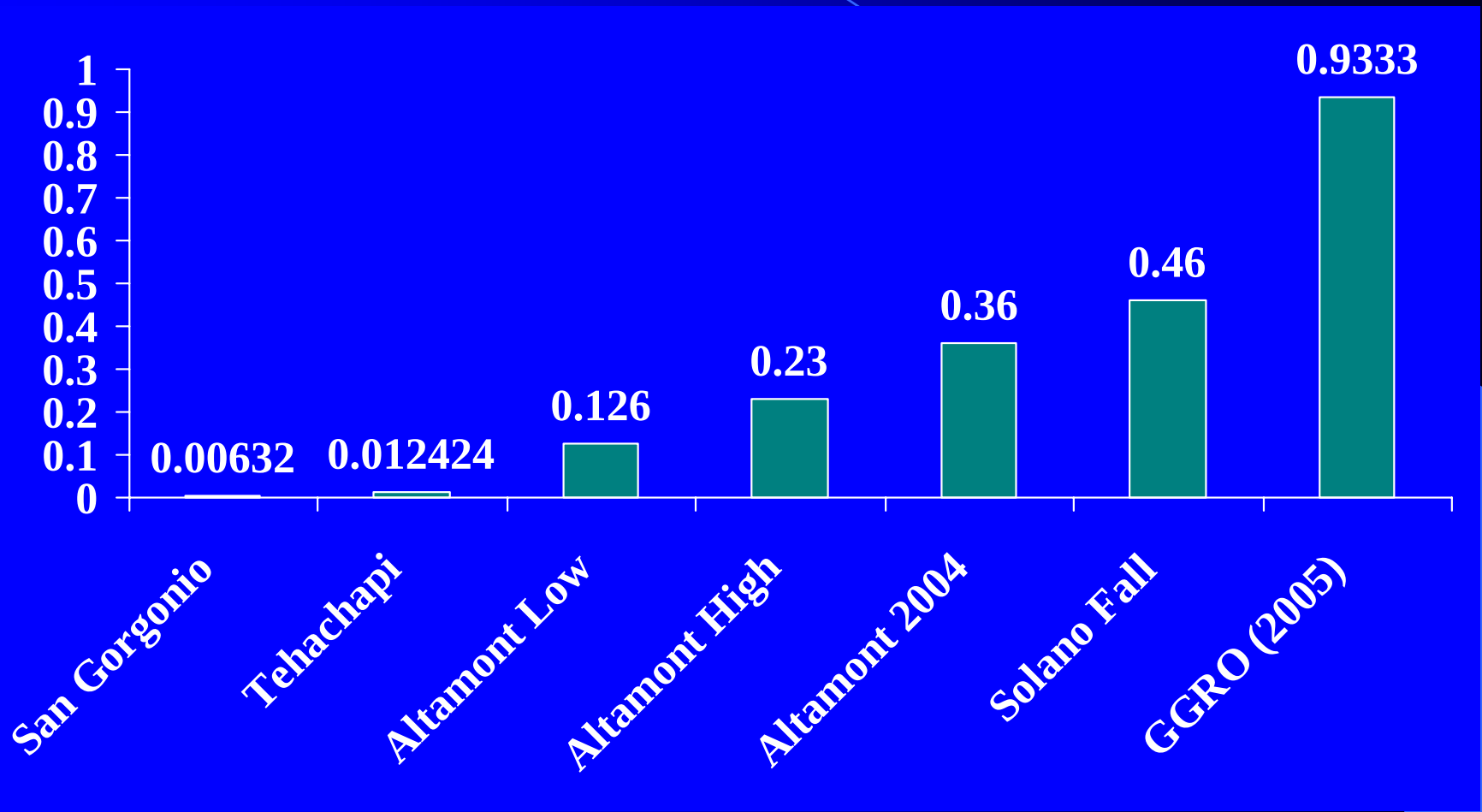
Thinking Ahead

- Concern regarding natural fatality levels---conduct one year of Carcass Searches during pre-permitting. A BACI sample design is preferred.
- Concern regarding carcass search frequency needed for operations monitoring---conduct Carcass Removal studies during pre-permitting

Special Case Example

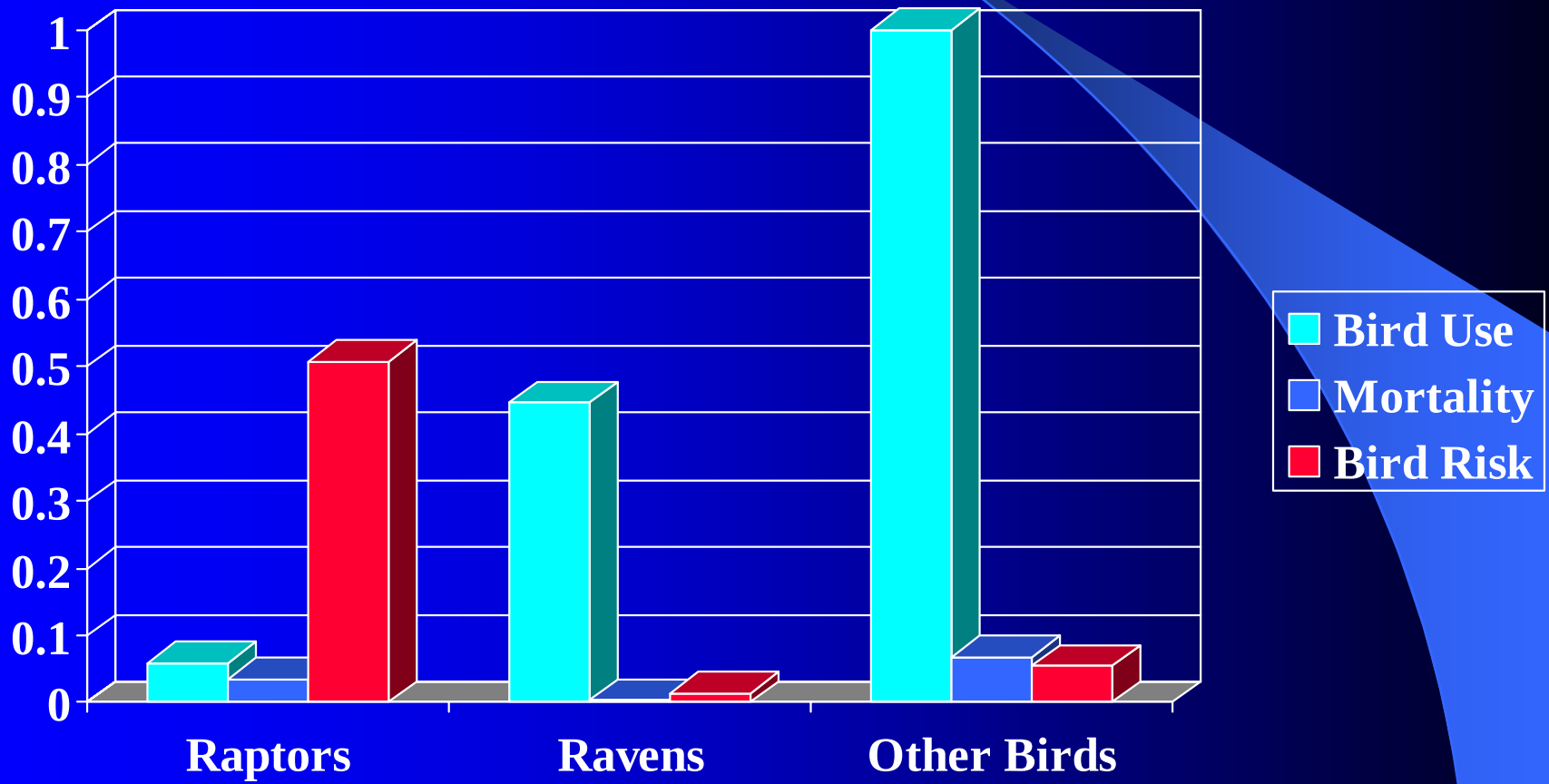
- Long-term information needed such as breeding density changes, population changes or displacement of use by a target species
- Tools such as mist netting, bird transects, point counts, or a combination of these may be needed for one or multiple years.

Raptor Use Comparison Between California WRAs (Raptors/minute)

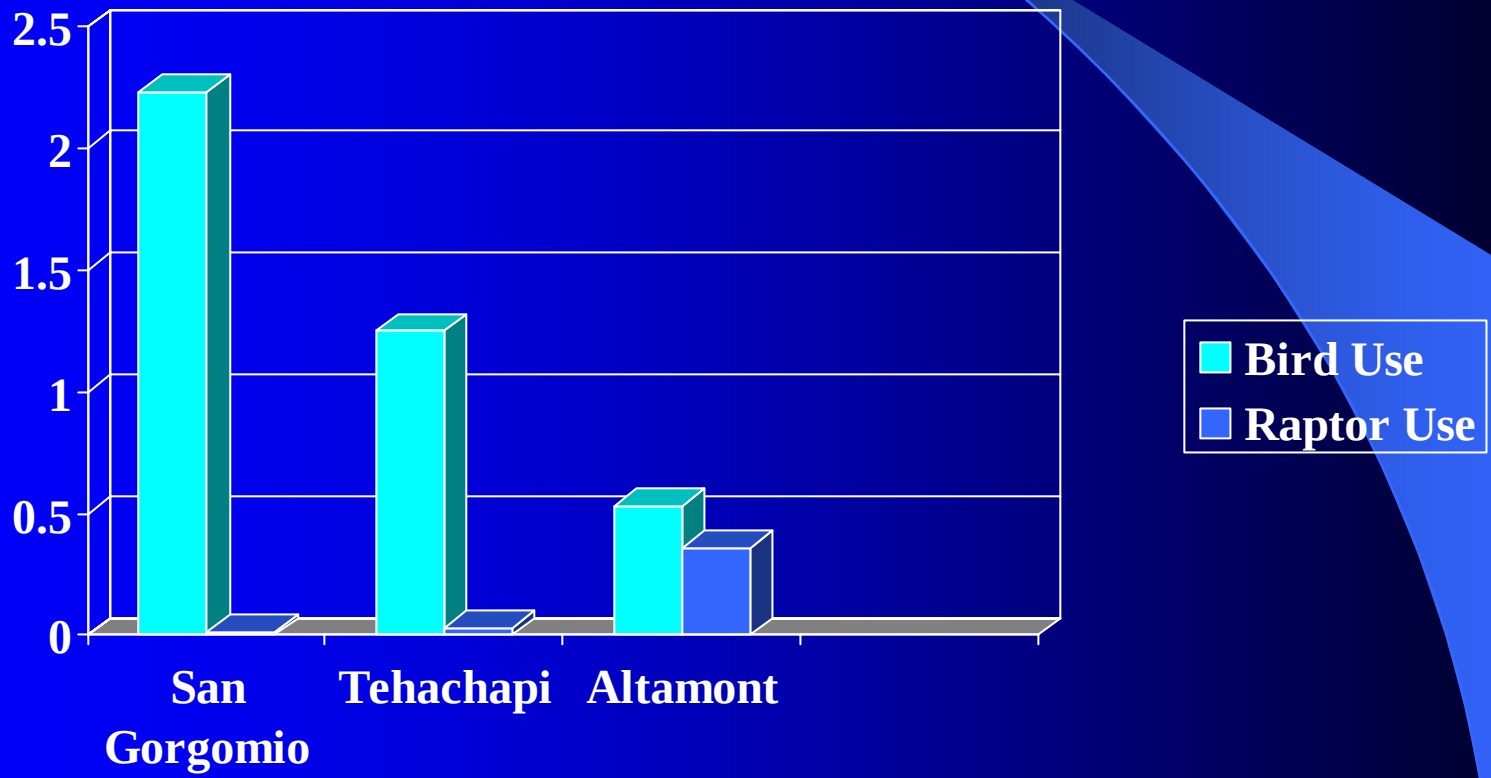


Variation Between Bird Groups

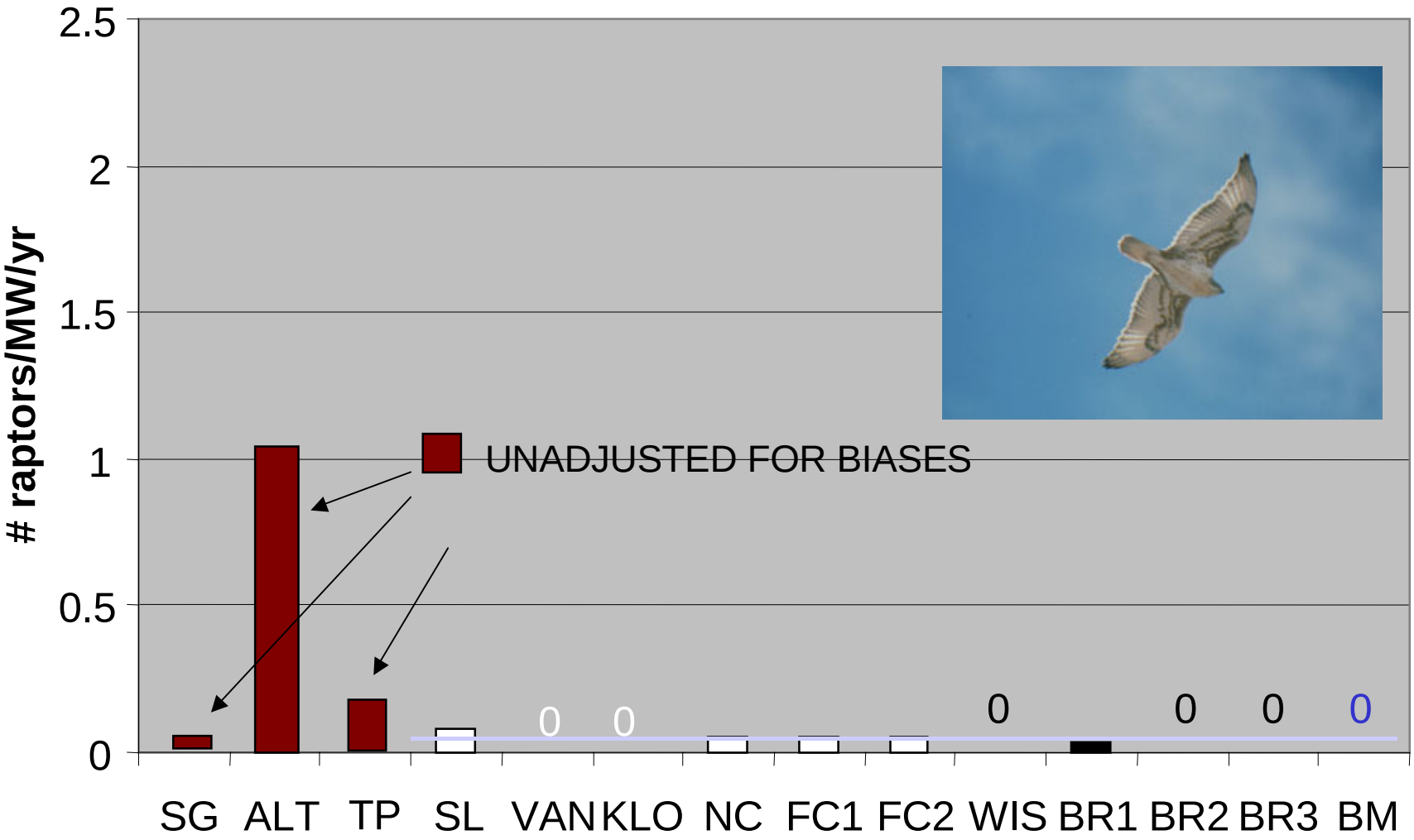
TEHACHAPI CA



Comparison of Overall Bird and Raptor Use



Raptor Fatalities/MW/YR



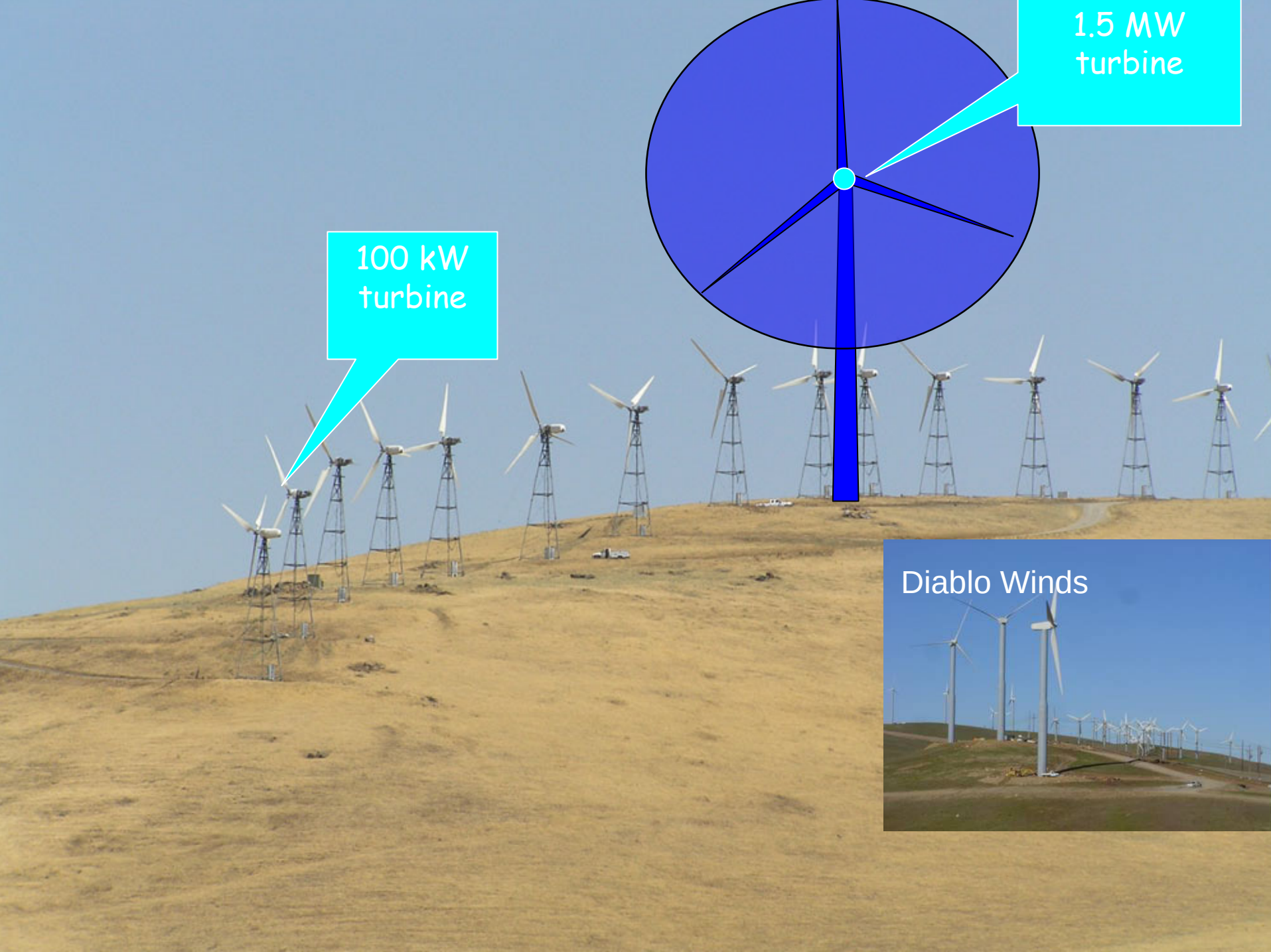
Standard Metrics

Bird Use - the number of birds detected utilizing a defined area during a defined time period (5-60 minutes).

One formula for Bird Use is:

$$\frac{\textbf{No. birds observed}}{\textbf{Time or Time and Area}} = \textbf{Bird Use}$$

- Raptors per minute
- Birds per minute in rotor swept risk area
- Birds per minute within 50 meters


1.5 MW
turbine
100 kW
turbine
Diablo Winds