



# APWRA Monitoring Year 2010 Q1 Preliminary QAQC Results Overview

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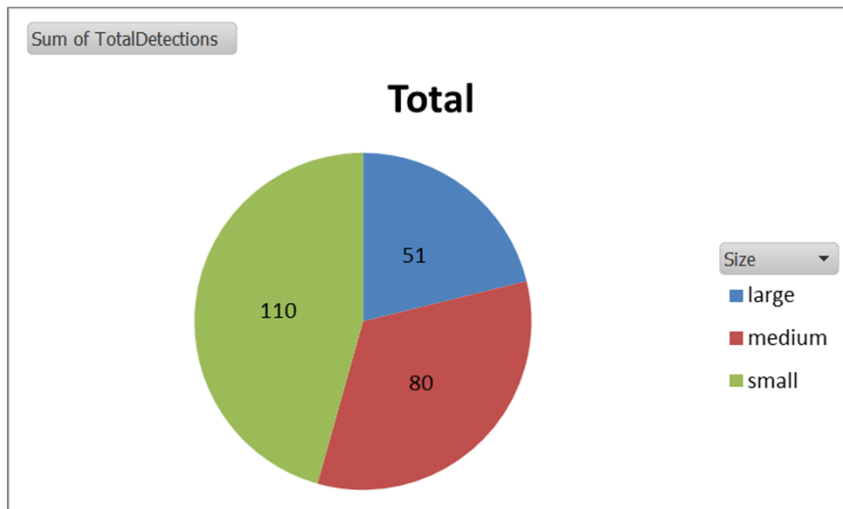
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## Level of Effort

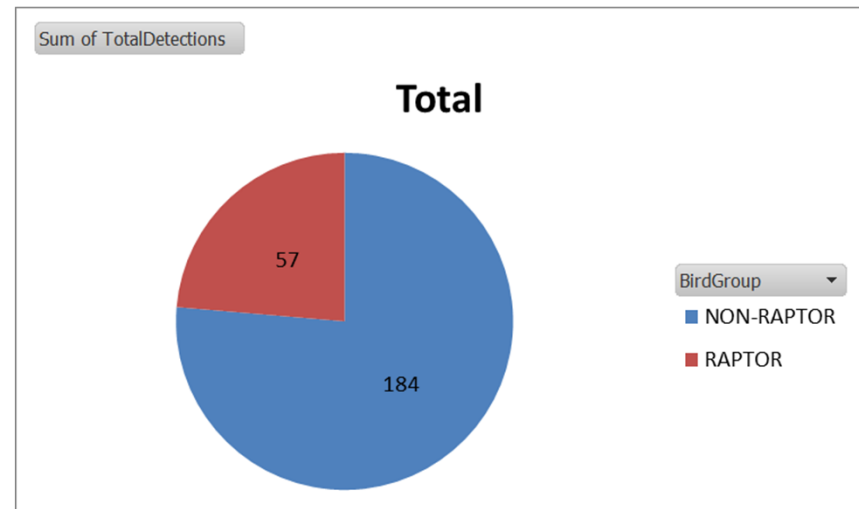
- 94 turbines pre-searched
- 889 turbines with secondary searches
- 476 turbines with follow-up searches
  
- 16 placed fatalities
- 117 unique fatalities
- 241 detections
  
- All BLOB experiments had at least one fatality – no nulls

# Detections

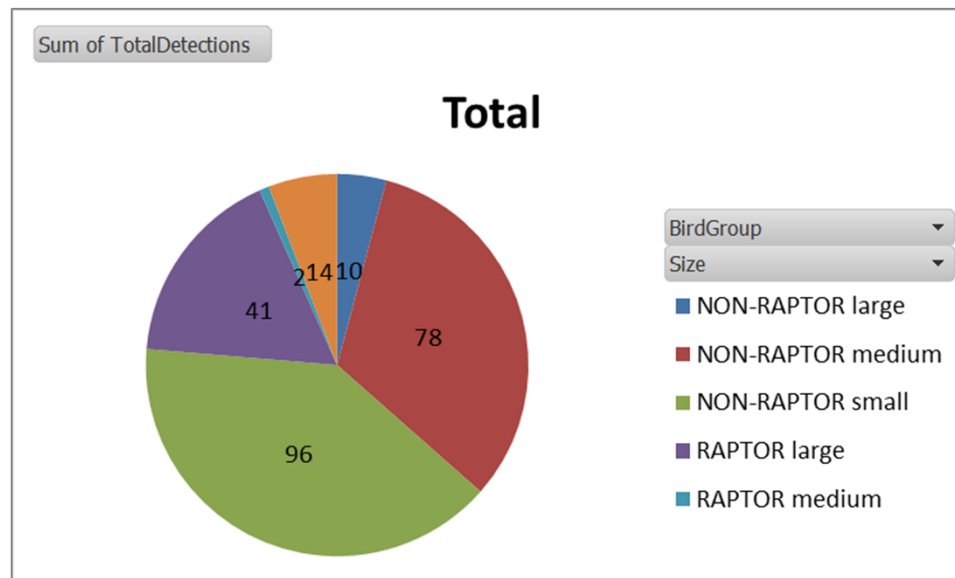
## Detections by Size



## Detections by Type



# Detections by Bird Group



## Placed Fatalities

### ■ Primary & Secondary Searches

- 12 of 16 birds placed were detected (75%)
- 5 of 9 small birds placed were detected (56%)
- 2 small raptors placed – both were detected (100%)
- 5 large raptors placed – all were detected (100%)
- 5 of 16 birds were detected by both primary & secondary searches (31%)
- Overall probability of detection for placed birds was 56% for primary searches and 50% for secondary searches

### ■ All Searches

- 15 of 16 birds remained detectable for the 7-10 day interval (94%)
- 7 of 8 small birds remained detectable for the 7-10 day interval (88%)

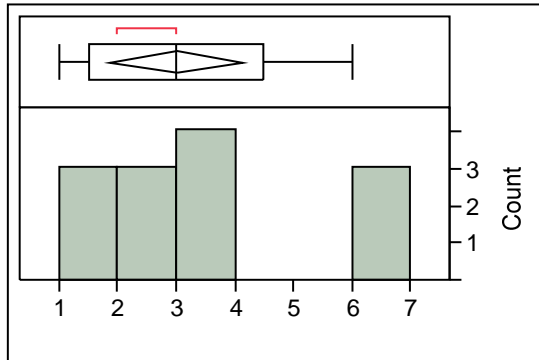
## Detection Probabilities

- 17 of 117 birds detected in pre or primary searches were also detected in secondary searches
- Primary searchers found 2X as many fatalities as secondary searchers for no apparent reason
- 24 of 69 small birds found in pre- or primary searches were subsequently detected by secondary or tertiary searches (35%)
- 30 of 60 large & medium birds found in pre- or primary searches were subsequently detected by secondary or tertiary searches (50%)

# Intervals



**Pre-Primary Interval**



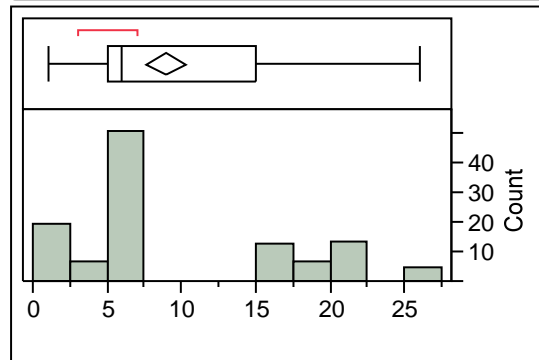
**Quantiles**

100.0% maximum	6
99.5%	6
97.5%	6
90.0%	6
75.0% quartile	4.5
50.0% median	3
25.0% quartile	1.5
10.0%	1
2.5%	1
0.5%	1
0.0% minimum	1

**Moments**

Mean	3
Std Dev	1.8708287
Std Err Mean	0.5188745
Upper 95% Mean	4.1305305
Lower 95% Mean	1.8694695
N	13

**Primary Secondary Interval**



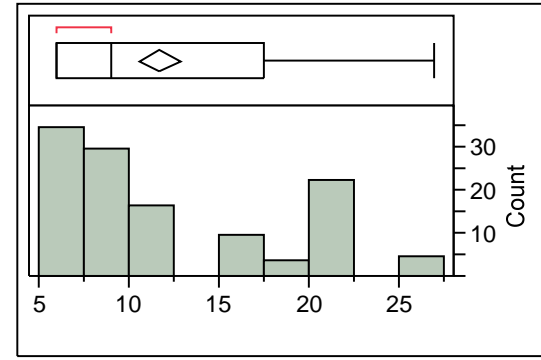
**Quantiles**

100.0% maximum	26
99.5%	26
97.5%	26
90.0%	20
75.0% quartile	15
50.0% median	6
25.0% quartile	5
10.0%	1
2.5%	1
0.5%	1
0.0% minimum	1

**Moments**

Mean	8.9272727
Std Dev	7.2170912
Std Err Mean	0.6881226
Upper 95% Mean	10.291109
Lower 95% Mean	7.563436
N	110

**Full Interval**



**Quantiles**

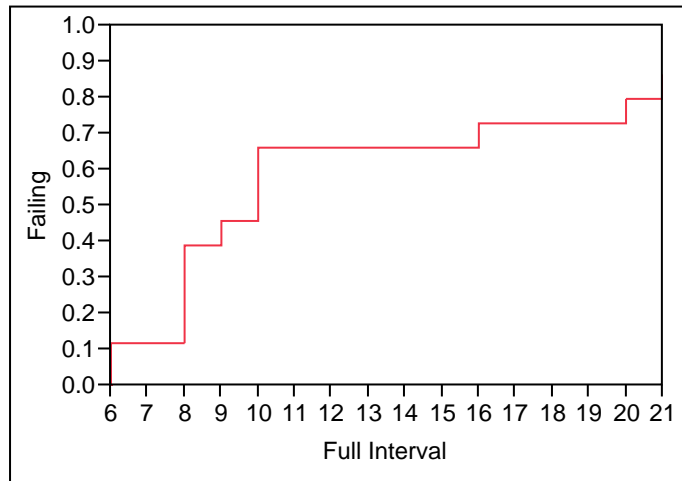
100.0% maximum	27
99.5%	27
97.5%	27
90.0%	21
75.0% quartile	17.5
50.0% median	9
25.0% quartile	6
10.0%	6
2.5%	6
0.5%	6
0.0% minimum	6

**Moments**

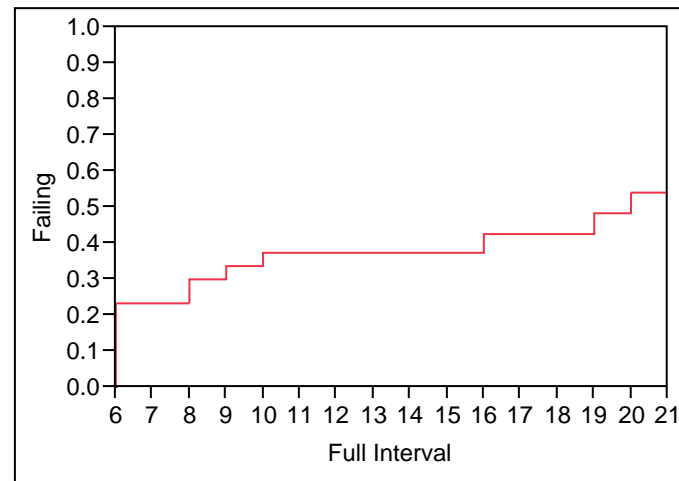
Mean	11.675214
Std Dev	6.2254055
Std Err Mean	0.5755389
Upper 95% Mean	12.815141
Lower 95% Mean	10.535286
N	117

# Timing of Known Removals

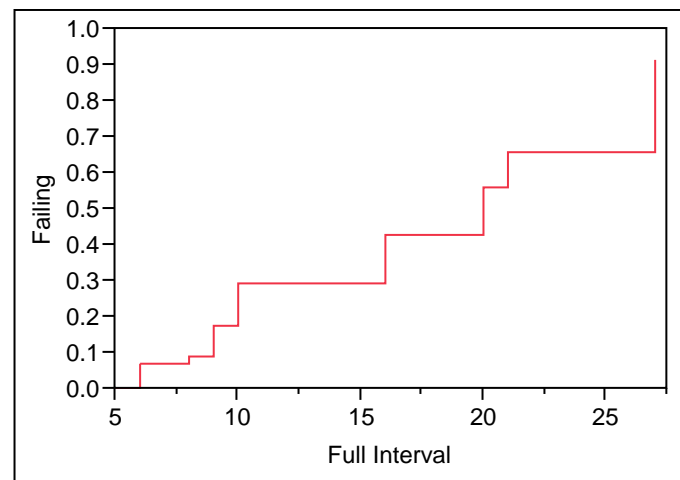
## Large Birds



## Medium Birds



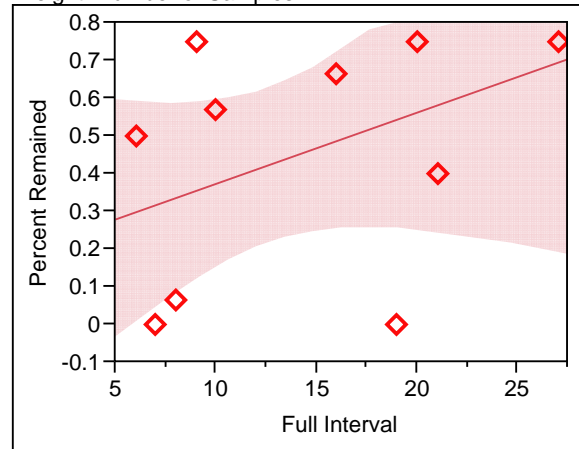
## Small Birds



# Small Bird Intervals

## Bivariate Fit of Percent Remained By Full Interval Size=small

Weight: Number of Samples



— Linear Fit

### Linear Fit

$$\text{Percent Remained} = 0.1841702 + 0.0188843 * \text{Full Interval}$$

### Summary of Fit

RSquare	0.190153
RSquare Adj	0.088922
Root Mean Square Error	0.672215
Mean of Response	0.421053
Observations (or Sum Wgts)	57

### Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.8488012	0.848801	1.8784
Error	8	3.6149833	0.451873	<b>Prob &gt; F</b>
C. Total	9	4.4637845		0.2077

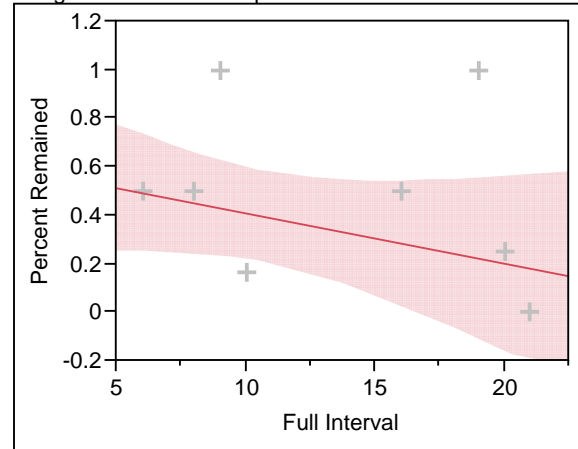
### Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	0.1841702	0.194423	0.95	0.3712
Full Interval	0.0188843	0.013779	1.37	0.2077

# Medium Bird Intervals

## Bivariate Fit of Percent Remained By Full Interval Size=medium

Weight: Number of Samples



— Linear Fit

### Linear Fit

$$\text{Percent Remained} = 0.6159135 - 0.0207534 * \text{Full Interval}$$

### Summary of Fit

RSquare	0.289924
RSquare Adj	0.171578
Root Mean Square Error	0.509761
Mean of Response	0.395349
Observations (or Sum Wgts)	43

### Analysis of Variance

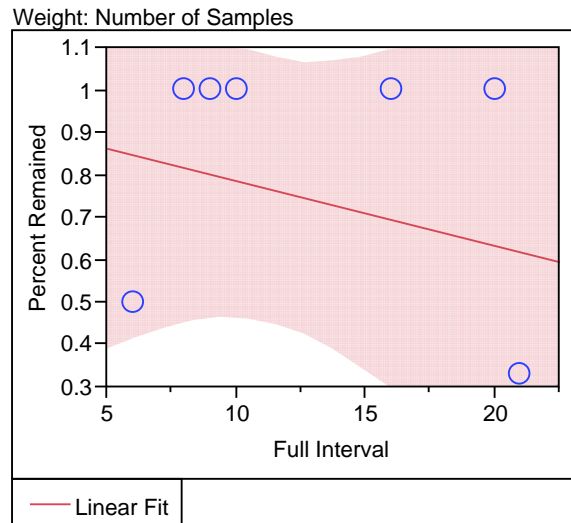
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.6365970	0.636597	2.4498
Error	6	1.5591394	0.259857	<b>Prob &gt; F</b>
C. Total	7	2.1957364		0.1686

### Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	0.6159135	0.160939	3.83	0.0087*
Full Interval	-0.020753	0.013259	-1.57	0.1686

# Large Bird Intervals

## Bivariate Fit of Percent Remained By Full Interval Size=large



### Linear Fit

Percent Remained = 0.9392503 - 0.0152951\*Full Interval

### Summary of Fit

RSquare	0.091771
RSquare Adj	-0.08988
Root Mean Square Error	0.502871
Mean of Response	0.764706
Observations (or Sum Wgts)	17

### Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.1277593	0.127759	0.5052
Error	5	1.2643975	0.252880	<b>Prob &gt; F</b>
C. Total	6	1.3921569		0.5090

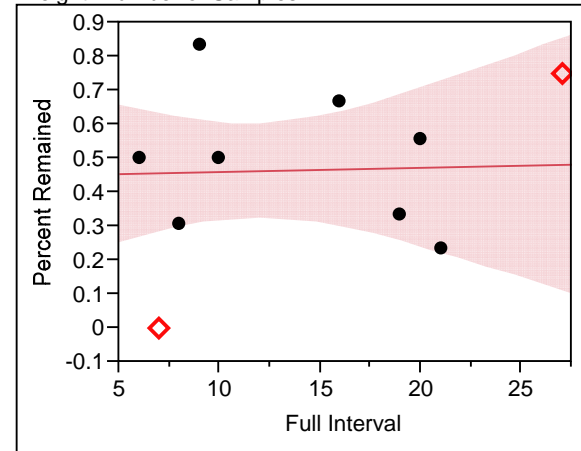
### Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	0.9392503	0.274185	3.43	0.0187*
Full Interval	-0.015295	0.021519	-0.71	0.5090

# All Bird Intervals

## Bivariate Fit of Percent Remained By Full Interval

Weight: Number of Samples



— Linear Fit

### Linear Fit

$$\text{Percent Remained} = 0.4471551 + 0.001232 * \text{Full Interval}$$

### Summary of Fit

RSquare	0.001991
RSquare Adj	-0.12276
Root Mean Square Error	0.653894
Mean of Response	0.461538
Observations (or Sum Wgts)	117

### Analysis of Variance

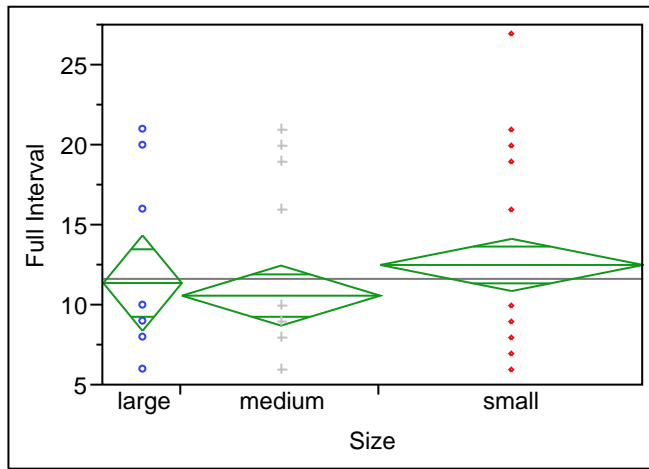
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	0.0068232	0.006823	0.0160
Error	8	3.4206202	0.427578	<b>Prob &gt; F</b>
C. Total	9	3.4274433		0.9026

### Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	0.4471551	0.128914	3.47	0.0085*
Full Interval	0.001232	0.009752	0.13	0.9026

# Bird Size vs. Removal

## Same Intervals



### Summary of Fit

Rsquare	0.02032
Adj Rsquare	0.003133
Root Mean Square Error	6.215646
Mean of Response	11.67521
Observations (or Sum Wgts)	117

## Different Removals

### Remained By Size

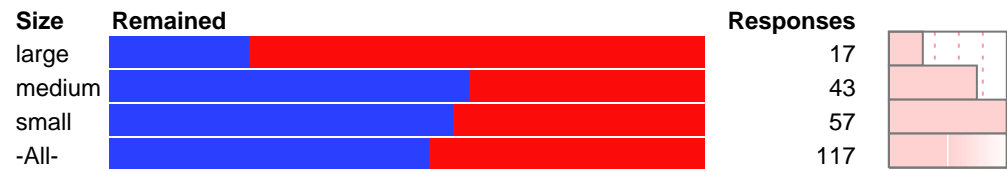
#### Frequency

Size	0	1	Responses
large	4	13	17
medium	26	17	43
small	33	24	57
-All-	63	54	117

#### Share of Responses

Size	0	1	Responses
large	0.2353	0.7647	17
medium	0.6047	0.3953	43
small	0.5789	0.4211	57
-All-	0.5385	0.4615	117

### Share Chart



## Preliminary Hypotheses

- Ha1: Searcher efficiency is highly variable
- Ha2: Searcher efficiency is lower than previously predicted
- Ha3: Percent remaining is higher than previously predicted
- Ha4: Searcher efficiency has a greater influence on detection probability than removal

## Preliminary Recommendations

- Mark-Recapture approach may not be implementable because the number of “same” fatalities found is very low
- “Control” and “Assure” quality via the QAQC program (i.e. adapt and adjust)
- Begin dog trials under the current QAQC program and budget to compare results using the pre-, primary-, secondary-, & follow-up design



*Research Article*

# Detection Distance and Environmental Factors in Conservation Detection Dog Surveys

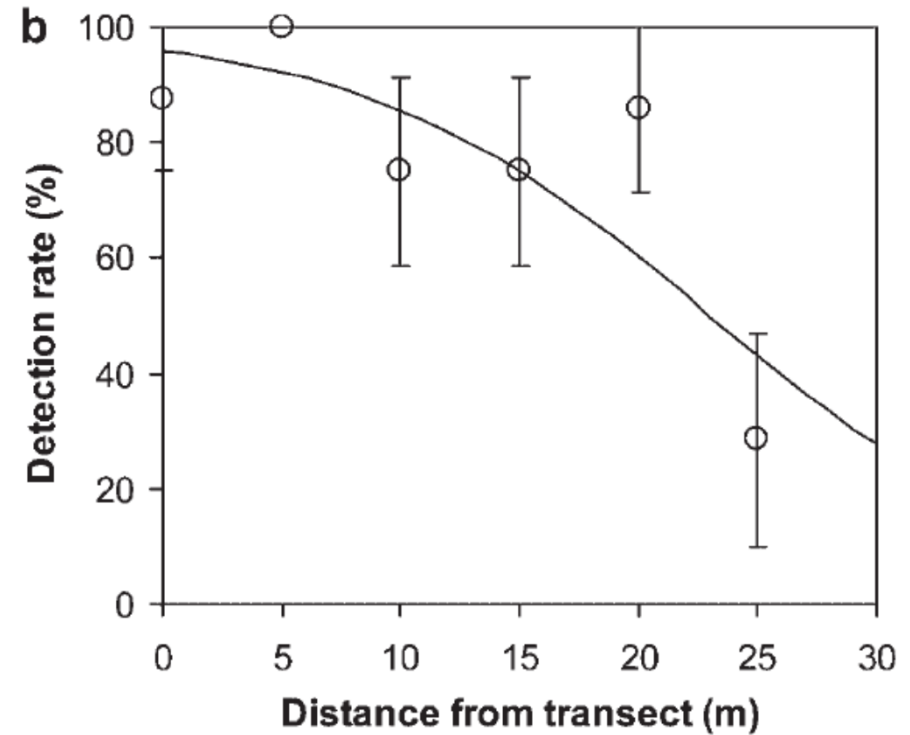
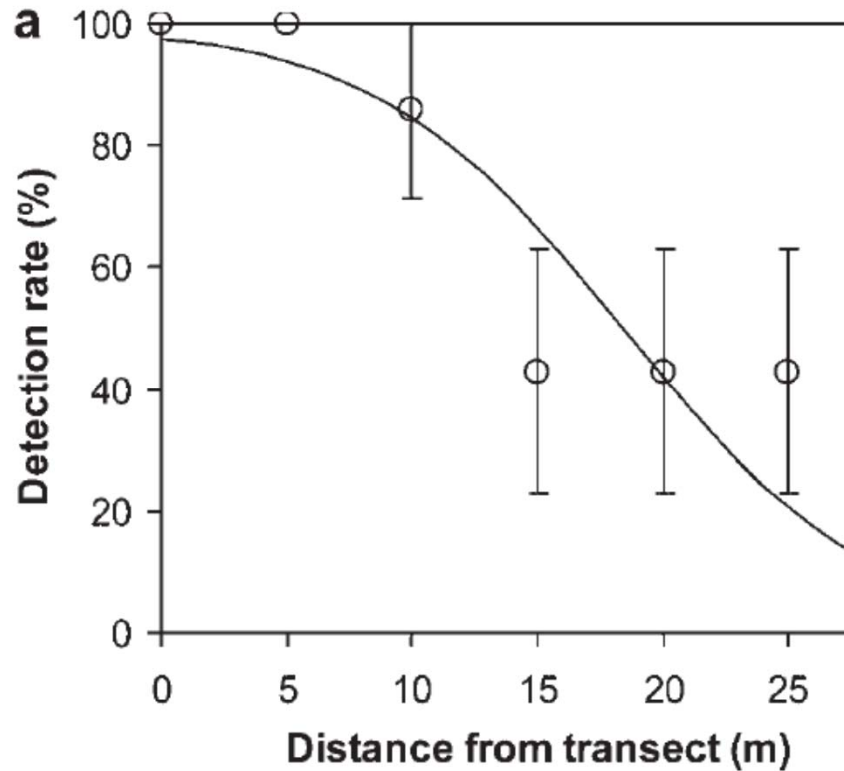
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**ALLISON L. BIDLACK,** *Department of Environmental Science, Policy and Management, University of California, Berkeley, 137 Mulford Hall #3110, Berkeley, CA 94720, USA*

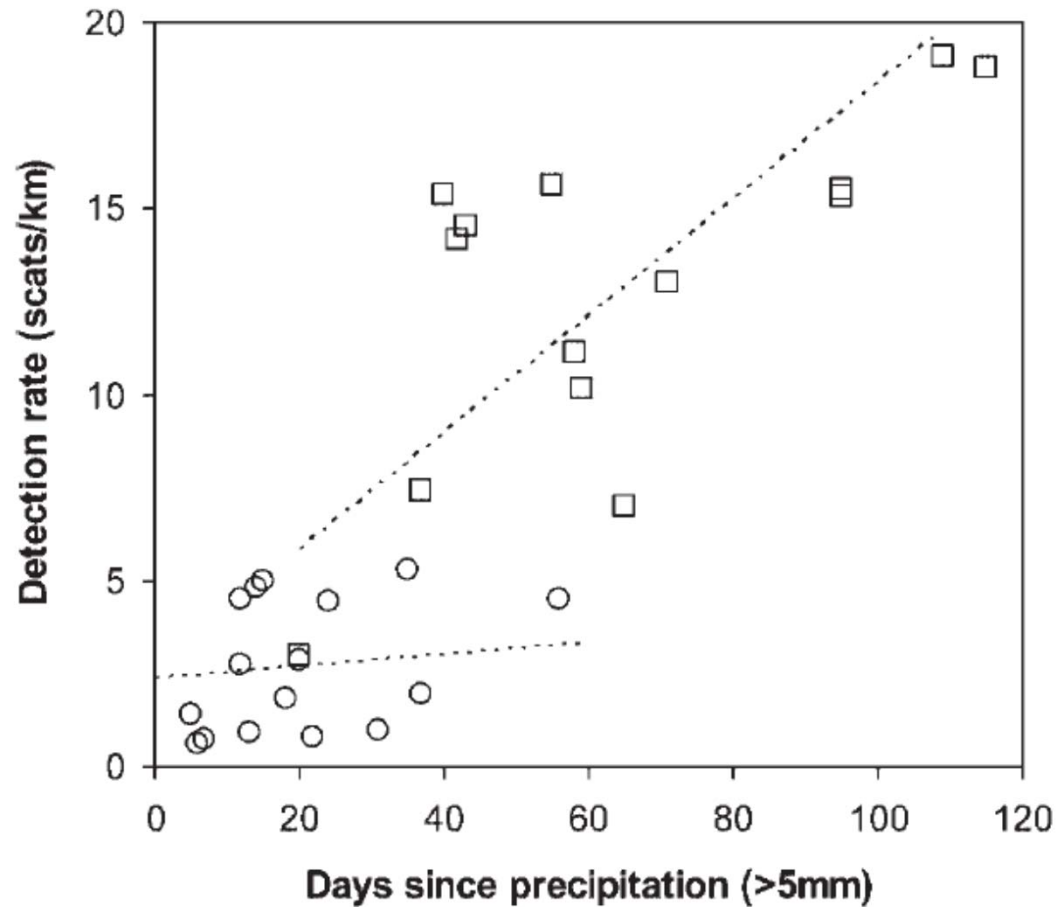
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# Repeatable Detection Probabilities



## Known Sources of Variance





Working Dogs  
for Conservation

Working with detection dogs  
to benefit science and conservation

  
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### A Nose for Wild Things

These are no hounds. These are highly trained detection dogs used by biologists to canvass for animals, scat, rare plants and invasive weeds that are easily missed by humans.

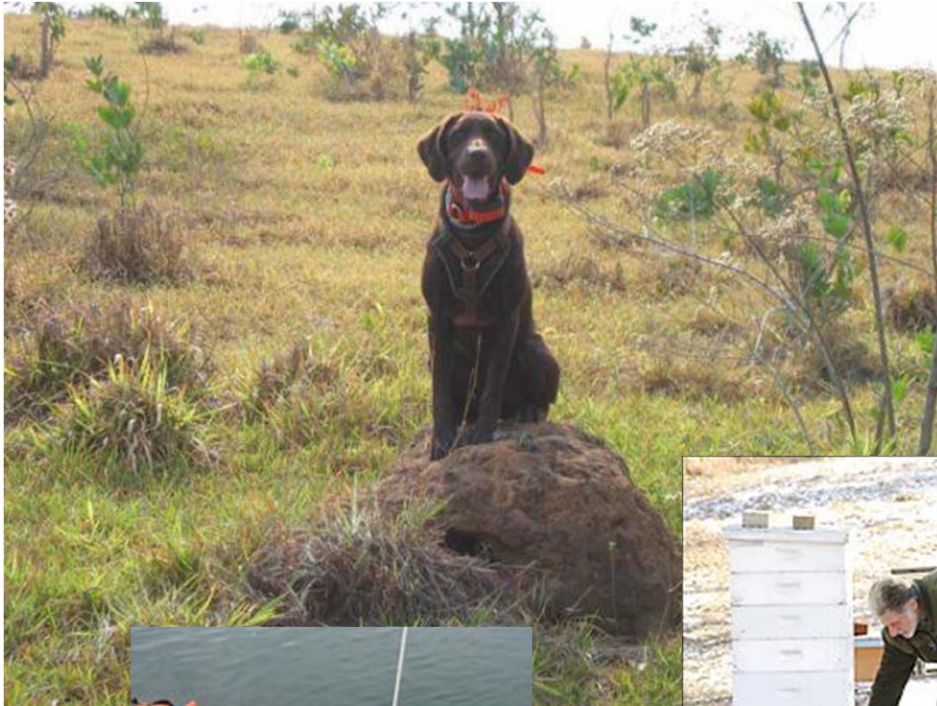
Text and Photos by Kenneth R. Weiss.





**Professional conservation dog teams  
to noninvasively measure species presence**

## + Cuteness



*Meet Dr. Cooper, a black Lab who has earned his Ph.D. in seal research.*