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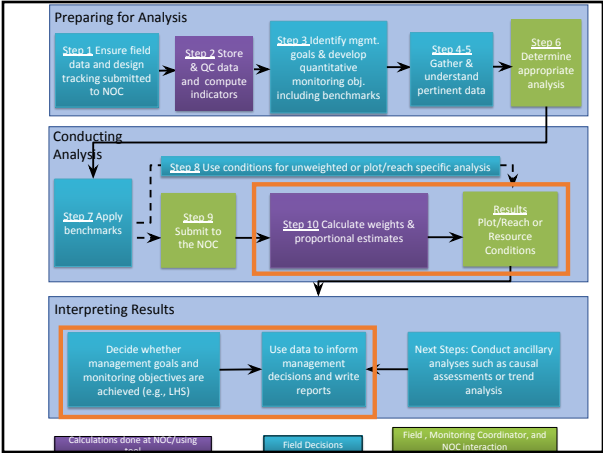
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## Confidence Intervals

- What is a confidence interval?
- What do they mean for management?
- What variables set the confidence interval?
- How do you interpret a confidence interval in a figure?

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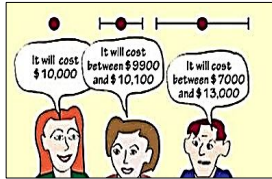
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## What are confidence intervals?

- The range of values that we are confident, to a certain degree of probability, contains the indicator value of interest



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## Example of a Confidence Interval

*With 80% degree of confidence, 75% ( $\pm 12%$ ) of the landscape is meeting the sagebrush cover objective.*

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## Example of a Confidence Interval

*With 80% degree of confidence, 75% ( $\pm 12%$ ) of the landscape is meeting the sagebrush cover objective.*

DEGREE OF  
PROBABILITY

CONFIDENCE  
INTERVAL

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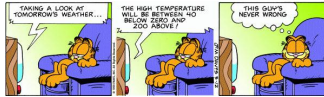
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## Bringing confidence intervals to a decision

- Define decision space
- When to have confidence in decision vs. when to exercise caution
  - Is more data realistic?
  - Do you need multiple lines of evidence?
- How much caution?



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## Confidence Intervals In English....

To calculate the confidence interval you need:

- 1) Indicator estimate
- 2) Sample size
- 3) Degree of probability
- 4) The standard deviation of the data used to calculate your indicator estimate

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## Confidence Intervals In English....

To calculate the confidence interval you need:

- 1) **Indicator estimate**  
Closer to 50%→Larger CI
- 2) **Sample size**  
Fewer points→ Larger CI
- 3) **Degree of probability**  
Management decision
- 4) **The standard deviation of the data used to calculate your indicator estimate**  
Calculated from data  
Larger standard deviation→Larger CI

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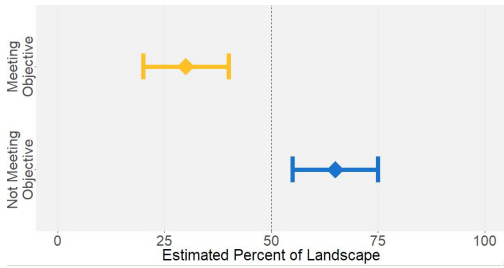
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## Interpreting a Figure




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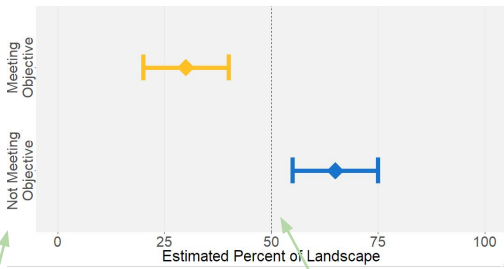
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## Interpreting a Figure

From User




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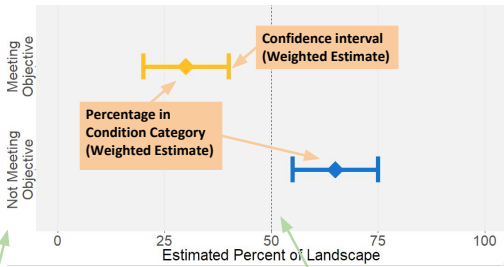
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## Interpreting a Figure

From Data From User




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## Interpreting a Confidence Interval

1. As a group, write a definition of a confidence interval
2. Based on the figure, what is the monitoring objective?
3. What conclusion would you draw from this figure?
4. Is your monitoring objective met?

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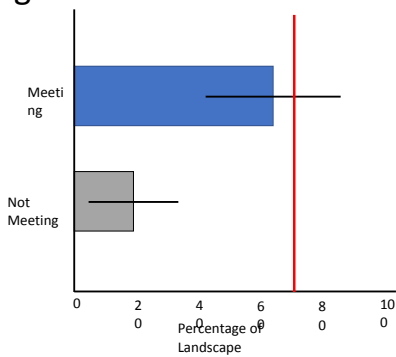
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Figure 1



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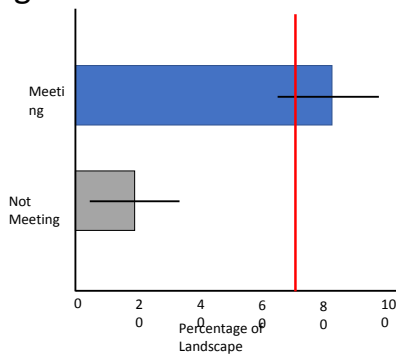
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Figure 2



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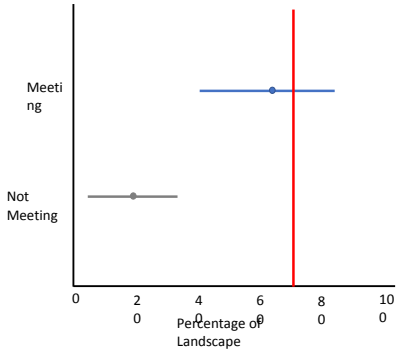
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Figure 3




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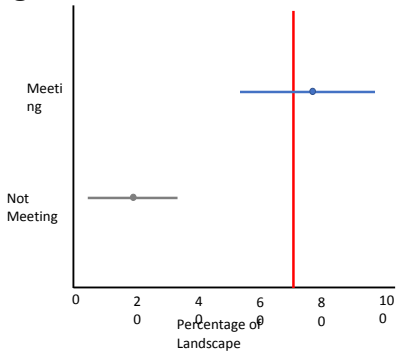
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Figure 4




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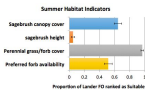
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## What do confidence intervals mean for management?

- Provides plausible estimate of the range quantitative uncertainty
- Tells us about the certainty of the estimate
  - Wider CI—relative uncertainty
  - Narrow CI—relative certainty
- Helps us understand chances of a false positive or false negative
  - Too low (lower degree of probability, narrow CI) means potential false alarms
  - Too high (higher degree of probability, wide CI) means potential to miss change/effect




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