

4: Setting Sampling Objectives

1. Identify which types of *management objectives* require complementary *sampling objectives*.
2. Identify the components needed for Change/Trend and Target/Threshold sampling objectives.
3. After completing exercise 3c, write complementary sampling objectives for two management objectives.



Monitoring Methodology Options

Qualitative

***no
sampling
objective***

Quantitative



***specify a
target/threshold
or change/trend
sampling
objective***

Census

***no
sampling
objective***

Monitoring Methodology Options

1. Management Objective:

Maintain at least 25 individuals of *Penstemon lemhiensis* at the study site during the next 10 years.

Census, no sampling objective

2. Management Objective:

Maintain at least 5000 individuals of *P. lemhiensis* at the study site during the next 10 years.

Quantitative sampling, t/t sampling objective

Monitoring Methodology Options

3. Management Objective:

Maintain the knapweed-free condition of the *P. lemhiensis* population at the study site during the next 10 years.

Qualitative assessment, no sampling objective

4. Management Objective:

Allow for no more than a 10% increase in cover of *Bromus tectorum* at the study site during the next 10 years.

Quantitative sampling, c/t sampling objective

Monitoring Methodology Options

Qualitative

*no
sampling
objective*

Quantitative

Census

*no
sampling
objective*

Target/Threshold

- *confidence level*
- *confidence interval width*

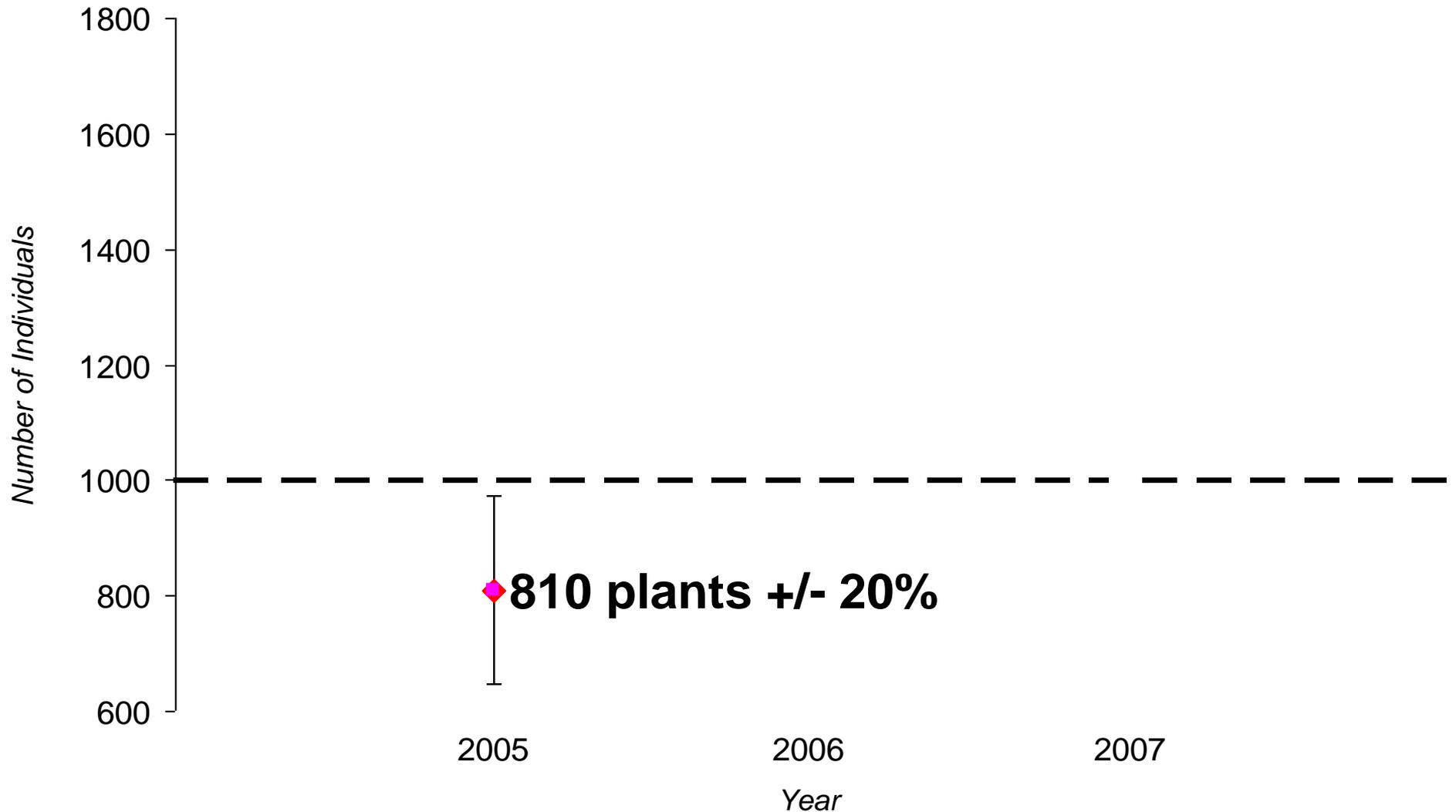
Change/Trend

- *missed-change error rate*
- *false-change error rate*
- *minimum detectable change*

Target/threshold

- 1. Confidence level.** How certain do you want to be that your confidence interval will contain the true value?
- 2. Confidence interval width.** How wide of a range will you accept around your estimated true value?

***Penstemon lemhiensis* at Iron Creek**
95% confidence intervals



Target/threshold

Management Objective:

Increase the number of individuals of *Penstemon lemhiensis* in the Iron Creek population to 1,000 individuals by 2010.

Sampling Objective:

We want to be 95% certain that population estimates are within 20% of the estimated value.

confidence interval

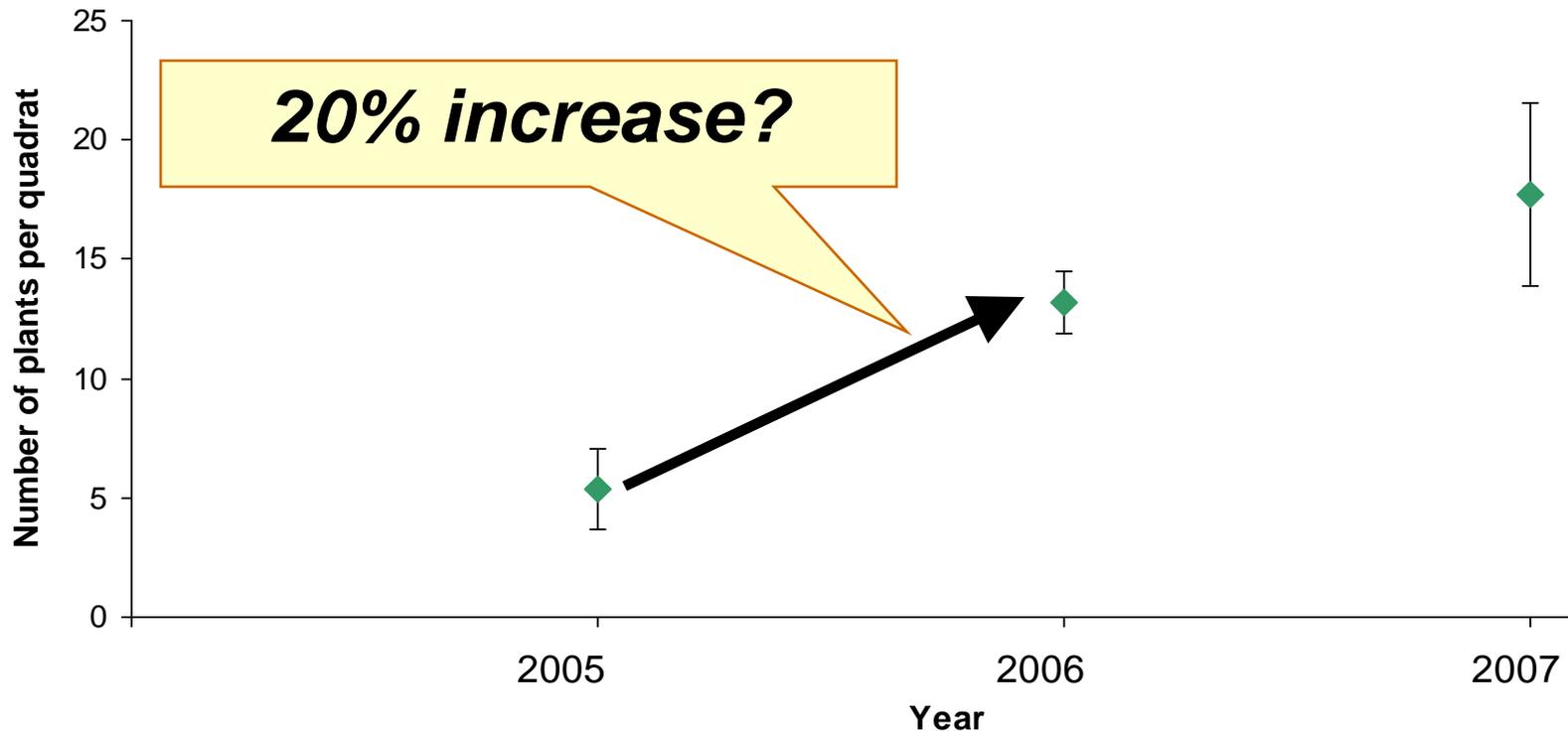
confidence level

Change/Trend

- 1. Power (1 - missed-change error).** How certain do you want to be that, if a particular change does occur, you will be able to detect it?
- 2. False-change error.** How much risk do you want to take of mistakenly detecting a change when none occurred?
- 3. Minimum detectable change.** What is the smallest change that you want to be able to detect?

Change/trend Management Objectives

Lomatium cookii at Agate Desert Preserve
95% confidence intervals



Change/Trend

Management Objective:

I want to see a 20% increase in the density of *Lomatium cookii* at the Agate Desert Preserve between 2005 and 2010.

Sampling Objective:

I want to be 90% certain of detecting a 20% increase in density, and I am willing to accept a 10% chance that I will make a false-change error.

false-change

min. detectable change

power (1 - missed-change)