

Biol 106 Ecology Modeling Lab - Fender's Blue Butterflies

Introduction

Prairies once covered large parts of western Oregon. In the last century, farms, cities, and roads have replaced most of this prairie habitat. Today, less than 1% of the indigenous prairie remains, distributed in isolated patches that are often separated by several kilometers.

Among the species that live in the prairie habitat is the Fender's blue butterfly. This is a small butterfly, about two centimeters across the wings. The male's wings have a tint of blue, which gives the butterfly its name. The Fender's butterfly requires native prairie species for nectar and larval food sources. Because of the reduction in prairie habitat, the Fender's blue butterfly is in danger of extinction. Less than 4000 of these butterflies are left in western Oregon.

The government and other private agencies are willing to attempt to save the Fender's butterfly by restoring old farmlands and other abandoned areas to butterfly habitat. Funds are available to restore 200 acres. Because the restoration process is time consuming and expensive, we would like to identify in advance which areas of land would be best to restore.

Your job is to use a modeling program to determine the best way to distribute the 200 acres of restored prairie in order to maximize the number of populations of Fender's blue butterflies.

Possible ways to distribute restored land:

- Make existing patches of prairie larger.
- Make corridors connecting existing patches of prairie.
- Make a series of small patches (stepping-stones) between the larger ones.
- ???

Data: Run each simulation for 700 weeks

Baseline:100 years ago:(Run simulation once, and share data with other tables)

Populations after700 weeks

1st trial _____
2nd trial _____
3rd trial _____
4th trial _____
5th trial _____
6th trial _____

Conclusions:

Baseline:Today

Populations after700 weeks

1st trial _____
2nd trial _____
3rd trial _____
4th trial _____

Conclusions:

Experimental: Patch expansion

Map Sketch

Populations after700 weeks

1st trial _____
2nd trial _____
3rd trial _____
4th trial _____

Conclusions:

Experimental: Corridors

Map Sketch

Populations after700 weeks

1st trial _____
2nd trial _____
3rd trial _____
4th trial _____

Conclusions:

Experimental: Stepping Stones

Map Sketch

Populations after 700 weeks

1st trial _____

2nd trial _____

3rd trial _____

4th trial _____

Conclusions:

Your Model 1:

Map Sketch

Populations after 700 weeks

1st trial _____

2nd trial _____

3rd trial _____

4th trial _____

Conclusions:

Your Model 2:

Map Sketch

Populations after 700 weeks

1st trial _____

2nd trial _____

3rd trial _____

4th trial _____

Conclusions:

Your Model 3:

Map Sketch

Populations after 700 weeks

1st trial _____

2nd trial _____

3rd trial _____

4th trial _____

Conclusions:

Based on your results, explain the best restoration plan for the Fender's blue butterfly.