

Western Monarch Count Instructions

Equipment List

Western Monarch Count Instructions (this sheet)
Western Monarch Count Site Specific Data Sheet
Pen or pencil
Binoculars
Clipboard (helpful but not required)
Kestrel pocket weather meter or outdoor weather thermometer (helpful but not required)
GPS unit or smart phone w/ GPS capability (helpful but not required)
Plant identification/field guide book (helpful but not required)
Camera (helpful but not required)
Compass (helpful but not required)

When and How Often to Count

Counts should be conducted at least once per season, although twice or more is preferred. The most important time to count is during the annual **Western Monarch Thanksgiving Count**, which takes place over three weeks surrounding the Thanksgiving holiday. If you can complete one additional survey, the next priority time is during the **New Year's Count**, which takes place over two weeks starting the weekend before New Year's. Feel free to establish weekly, bi-weekly, or monthly schedules throughout the monarch overwintering season (late October through early March). Even if you conduct surveys throughout the season, it is important to include counts at Thanksgiving and around New Year's in order to compare cluster sizes in a standardized way across sites and years.

Surveys should be conducted by **at least two observers** in the early morning while temperatures are low (usually below 13 °C or 55 °F) and monarch butterflies are still clustered. Record weather before beginning to count and at same location in the grove each visit. Wind direction is the direction that the wind is coming FROM.

Note: Do not survey during heavy precipitation and/or strong winds because of poor visibility and increased chances of the butterflies being scattered and on the ground.

Cluster Estimation Protocol

Record each cluster on a separate row of the datasheet

1. Individually count small area of cluster and then extrapolate out to arrive at total for entire cluster; repeat count and take the average.
2. Record average of all observers' counts within 20% (only counts that are within a 20% margin should be considered. If counts are not within 20% discuss why and then start the count again)
3. Exclude sunners, loners, fliers, and grounders—these categories are tracked separately
4. Sum all clustered monarchs + sunners, loners, fliers, and grounders for a grand total of all monarchs observed at the site

Definitions

Cluster: more than two adjacent butterflies with closed wings (likely that the cluster formed the previous day)

Sunners: wings are open and temperatures exceed 55° F (likely that the sunning butterflies flew from their cluster to the sunning location)

Loners: two (adjacent) or fewer butterflies with closed wings not associated with a cluster

Fliers: estimated number of butterflies in flight

Grounders: estimated number of live butterflies on ground (NOTE: if you have time, you can count dead monarchs too; make a separate line on the data sheet)