

**DATASHEET #1 SUMMARY: MONARCH DENSITY (WEEKLY SUMMARY)**

**Date:** \_\_\_\_\_ **Observers:** \_\_\_\_\_ **Site Name:** \_\_\_\_\_  
**Start Time:** \_\_\_\_\_ **Stop Time:** \_\_\_\_\_ **Temp in Shade:** \_\_\_\_\_ **City, State:** \_\_\_\_\_

Eggs	1 <sup>st</sup> Instars	2 <sup>nd</sup> Instars	3 <sup>rd</sup> Instars	4 <sup>th</sup> Instars	5 <sup>th</sup> Instars	# of Adults (F = female M = male U = unknown)	# Dead (egg or larval stage)	# of Milkweed Plants Observed (use tick marks to represent 1, 5, 10, or 20 plants and record total at end of session)

**Plants in bloom at site (species, not numbers of plants!):**  
 \_\_\_\_\_  
 \_\_\_\_\_

**Note any disturbances that occurred at the site over the past week (mowing, herbicide spraying, haying, etc.):**  
 \_\_\_\_\_  
 \_\_\_\_\_

**Did you see any *Aphis nerii* at your site this week? Circle one:** Yes No Didn't look

**Other Notes:**

## ACTIVITY #1 DETAIL: MONARCH DENSITY (WEEKLY DENSITY PER MILKWEED PLANT)

**Objective:** Activity #1 DETAIL, like the simpler Activity #1 SUMMARY, results in an estimate of monarch density at your site. The difference is that you will keep track of the number of monarchs you observe on individual plants, instead of just reporting the total numbers of plants and monarchs that you observe. Whereas in the simpler activity you would report seeing, for example, 4 eggs on a total of 100 plants observed, this protocol will allow you to report if these eggs were on 4 separate plants, or if they were all on the same plant. This information will be useful in understanding potential impacts of crowding on monarch survival. Because you will also be recording the milkweed species, we'll be able to assess how female monarchs make egg-laying decisions when they have more than one milkweed species in a single site. Your data will be added to overall monarch densities, but will also be analyzed separately.

**Method:** Follow the directions for Activity #1 SUMMARY, with these modifications. When you look at a plant with no monarchs, place a tick mark in the box labeled "0 monarchs/plant." When you see one monarch on a plant, write "e," "1st," "2nd," "3rd," "4th," or "5th" (depending on whether you see an egg or a first, second, etc. instar) in one of the boxes under the words "1 monarch/plant." When you see 2 monarchs on a plant, write "e,e" or "e,1st," or "1st,1st," etc., depending on the stage of the two monarchs you see. Do the same in the boxes under the words "3 monarchs/plant," "4 monarchs/plant," and ">4 monarchs/plant" as needed. Note if an individual is dead; for example, if you see a dead first instar and a live first instar on a plant, you would note "dead 1<sup>st</sup>, 1<sup>st</sup>". At the end of the session, add up the total number of plants (including those with and without monarchs), eggs, and larvae you observed, and tally this in the appropriate section in the summary below below the table.

If you have only one species of milkweed on your site, you'll use one table per monitoring session. If you have more than one milkweed species, you should keep a separate table for each species you observe. There are two tables per sheet.

## DATASHEET #1 DETAIL: WEEKLY MONARCH DENSITY PER MILKWEED PLANT

Year: \_\_\_\_\_ Observers: \_\_\_\_\_ Site Name: \_\_\_\_\_ City, State: \_\_\_\_\_

Date: \_\_\_\_\_ Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_ Temp in Shade: \_\_\_\_\_

Key: e = egg | 1 or 1<sup>st</sup> = 1<sup>st</sup> instar | 2 or 2<sup>nd</sup> = 2<sup>nd</sup> instar | 3 or 3<sup>rd</sup> = 3<sup>rd</sup> instar | 4 or 4<sup>th</sup> = 4<sup>th</sup> instar | 5 or 5<sup>th</sup> instar | p = pupae

**EXAMPLE OF DATA COLLECTION PROCESS AND DATA ENTRY.** Record each plant you observe, using a separate table for each milkweed species. If the plant has no monarchs, make a tick mark under 0 monarchs/plant. If it has one or more monarchs, use the key above to record their stage(s) in a cell under the correct column.

Milkweed Species: Common

0 monarchs/plant	1 monarch/plant				2 monarchs/plant		3 monarchs/plant		4 monarchs/plant	>4 monarchs/plant
	e	2 <sup>nd</sup>	2 <sup>nd</sup>			1 <sup>st</sup> , 2 <sup>nd</sup>		e, e, 3 <sup>rd</sup>	e, e, 3 <sup>rd</sup>	

SUMMARY TABLE FOR DATA ENTRY	
0 monarchs	6
1 egg	1
1 2 <sup>nd</sup> instar	2
1 1 <sup>st</sup> & 1 2 <sup>nd</sup> instar	1
2 eggs & 1 3 <sup>rd</sup> instar	2

When finished monitoring, fill out the **SUMMARY TABLE FOR DATA ENTRY**. Create a row for each unique configuration of monarchs on a plant, i.e., the exact same stages and numbers of eggs and larvae. E.g., In the bolded row to the left, you saw 2 plants with one 2<sup>nd</sup> instar each.

In the **data portal**, enter each row of this summary table. The portal will ask: "Did you see any monarch eggs or larvae on this plant?" For the bolded row, you'd enter **yes** and then record the stages: "Live 2<sup>nd</sup> instars" = 1. It will then ask: "How many plants *exactly like this one* did you see?" You'd enter 2: you saw two common milkweed plants with one 2<sup>nd</sup> instar each. Click "save and add another plant" and continue entering the rest of your summarized data.

As a final step, summarize the week's monitoring findings in the **SITE TOTALS FOR DATA CHECKING** table to double check the data you've entered in the data portal.

SITE TOTALS FOR DATA CHECKING	
Total plants: 12	Total eggs: 5
Total 1 <sup>st</sup> s: 1	Total 2 <sup>nd</sup> s: 3
Total 3 <sup>rd</sup> s: 2	Total 4 <sup>th</sup> s:
Total 5 <sup>th</sup> s:	
Dead (list stages):	

1st Milkweed Species: \_\_\_\_\_

0 monarchs/plant	1 monarch/plant				2 monarchs/plant		3 monarchs/plant		4 monarchs/plant	>4 monarchs/plant

SUMMARY TABLE FOR DATA ENTRY (1 <sup>st</sup> milkweed species)	
0 monarchs	

SITE TOTALS FOR DATA CHECKING	
Total plants:	Total eggs:
Total 1 <sup>st</sup> s:	Total 2 <sup>nd</sup> s:
Total 3 <sup>rd</sup> s:	Total 4 <sup>th</sup> s:
Total 5 <sup>th</sup> s:	
Dead (list stages):	

SEE TOP OF OTHER SIDE for additional milkweed species in your site

SEE BOTTOM OF OTHER SIDE for additional data fields (adult monarchs, blooming plants, disturbance, etc.) for this monitoring session

2<sup>nd</sup> Milkweed Species (if observed): \_\_\_\_\_

0 monarchs/plant	1 monarch/plant					2 monarchs/plant		3 monarchs/plant	4 monarchs/plant	>4 monarchs/plant

SUMMARY TABLE FOR DATA ENTRY (2 <sup>nd</sup> milkweed species)			
<i>0 monarchs</i>			

Be sure to add these plants to your SITE TOTALS FOR DATA CHECKING table on the first page.

Plant species blooming this week: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Note any disturbances at your site this week: \_\_\_\_\_

Did you see any adult monarchs this week?    Number of females \_\_\_\_\_ Number of males \_\_\_\_\_ Number of unknown sex \_\_\_\_\_

Did you see any oleander aphids (bright yellow *Aphis nerii*) at your site this week? Circle one:    Yes    No    Didn't Look

Other notes or observations:

\_\_\_\_\_

\_\_\_\_\_