

## USDA NRCS MONARCH BUTTERFLY WILDLIFE HABITAT EVALUATION GUIDE AND DECISION SUPPORT TOOL: *WESTERN U.S. EDITION*

### INTRODUCTION

#### Monarch Butterfly and Habitat

The western U.S. population of the monarch butterfly (*Danaus plexippus*) has suffered significant declines over the past two decades. NRCS is targeting a habitat development effort within known migration routes and the primary breeding range. For general information on the monarch butterfly, staff are encouraged to read the document titled *NRCS Monarch Butterfly Habitat Development Project (NRCS 2015)* and for specific details on the status of the western monarch butterfly see [Jepsen et al 2015](#). NRCS conservation practices installed to benefit the monarch will typically benefit other wildlife species that occupy periodically disturbed mid-successional (seral plant community stage) habitats.

Monarch butterflies rely on nectar-rich forbs for forage in all life stages, and milkweed species for successful reproduction. Any monarch butterfly habitat assessment must target the milkweed and forb component.

#### Evaluating Monarch Habitat

Many NRCS wildlife evaluation guides determine the quality of habitat at the farm/ranch scale (cumulative score for entire project area) where the objective is a resource management system (NRCS 2013). The objective of these WHEGs is to identify the most limiting factor and consider the proximity and interrelationships to adjacent habitats. This approach is particularly appropriate for resident species with limited mobility, distribution and home ranges.

The challenges with addressing the declines in the monarch butterfly mandate a different approach. When not migrating, the movement of individual monarchs is not well understood; however, they appear to move long distances to acquire life requirements (Brower 1995, Brower et. al 2011). Little is known about the importance of the spatial connectivity of habitats during the migratory or non-migratory periods of the monarch's life cycle. Accordingly, rather than evaluate habitat spatially within the context of home range of a population of a species of concern, this guide is narrowly applied to only those portion(s) of the agricultural operation under consideration for monarch habitat improvement, and does not consider connectivity to, or interactions with other habitats. Based on best available science (Pleasants and Oberhauser 2012; Brower et. al 2011), the limiting factor for monarchs is the availability of reproductive habitats (milkweed abundance and distribution). Accordingly, the target habitat conditions identify and consider milkweed as the most significant critical component.

#### Rating Monarch Habitat

The ratings derived from this WHEG are not designed to be used as a ranking mechanism for Farm Bill conservation programs. Maintaining the integrity of this WHEG as a planning tool and not a Farm Bill program ranking tool, allows the conservation planner the opportunity to apply the WHEG in a flexible approach, incorporating professional judgments deemed necessary for unique site conditions, varying

financial resources and objectives. With the decision to limit the WHEG as a planning tool, the scoring process is not encumbered with concern of consequences of the rating related to Farm Bill program eligibility.

### Timing of the Evaluation

Conduct the evaluation during the growing season in order to determine the amount and variety of nectaring plants and milkweed present on the assessment area.

## INSTRUCTIONS

### **STEP 1: Use a copy of the conservation plan map or aerial photo to develop a project base map.**

- a. Delineate the area to be evaluated on an aerial photograph. The area to be considered for monarch habitat improvements is referred as the “*project area.*” *Note: The project area may be the USDA Tract boundaries, but not always. In some situations it may be a single field or portion of field. The decision of the project area boundaries is left to the discretion of the conservation planner and decision-maker.*

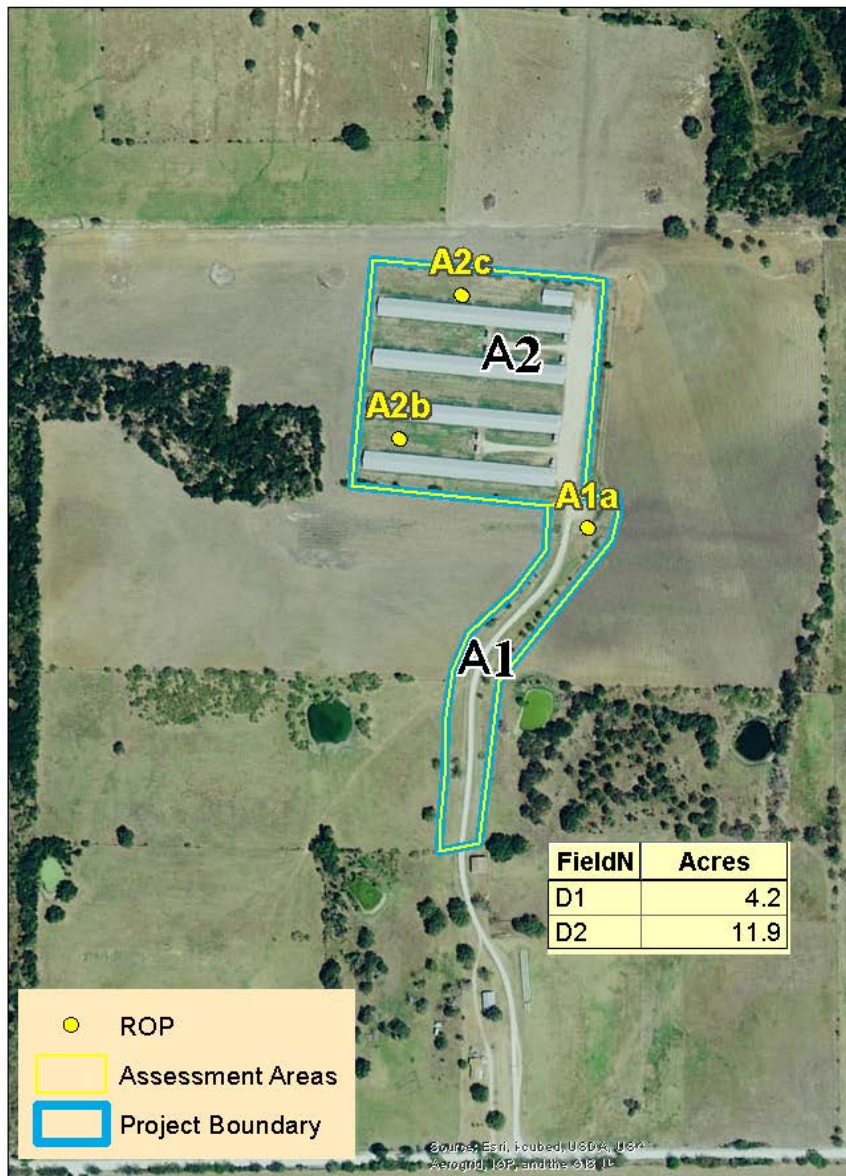
Monarch Fact: Narrow forested riparian areas and edges of larger blocks of land supporting trees often provide important resting cover (micro-climates) for migrating monarchs, particularly during the fall migration.

- b. Delineate unique assessment areas within the project area. As appropriate, subdivide the project area into smaller, unique areas to be assessed based on consistent land type (i.e. similar ecological sites, vegetation, soils, slope, and management). These unique areas are referred to as *assessment areas* (AA). Identify each assessment area on the base map. To not conflict with Common Land Units (CLU) and USDA field numbering, choose an alphabetical notation (A, B, and C). An assessment area need not be fully contained in a contiguous polygon. For example, if more than one portion of the project area supports similar characteristics (i.e. dense stands of *juniper* on steep slopes) then each polygon supporting these conditions will be assigned the same label. For these situations, follow a sequential numeric notation (A1, A2, A3, etc.) to denote that a group of non-contiguous areas (“sub-assessment areas” or “subareas”) have similar characteristics and will be considered as one assessment area. See Figures 1 and 2 for examples.
- c. Determine size of each area. Determine and denote the acres in each assessment area (including each subarea) on the base map.

### USER NOTE

This WHEG allows the planner to rapidly screen out AAs that will not require the completion of a vegetation survey based on the plant community. For example, vegetative sampling to determine the density of milkweed and/or nectaring species has limited value in a cropland field or range dominated by cheat grass.

### Monarch Butterfly Habitat Base Map

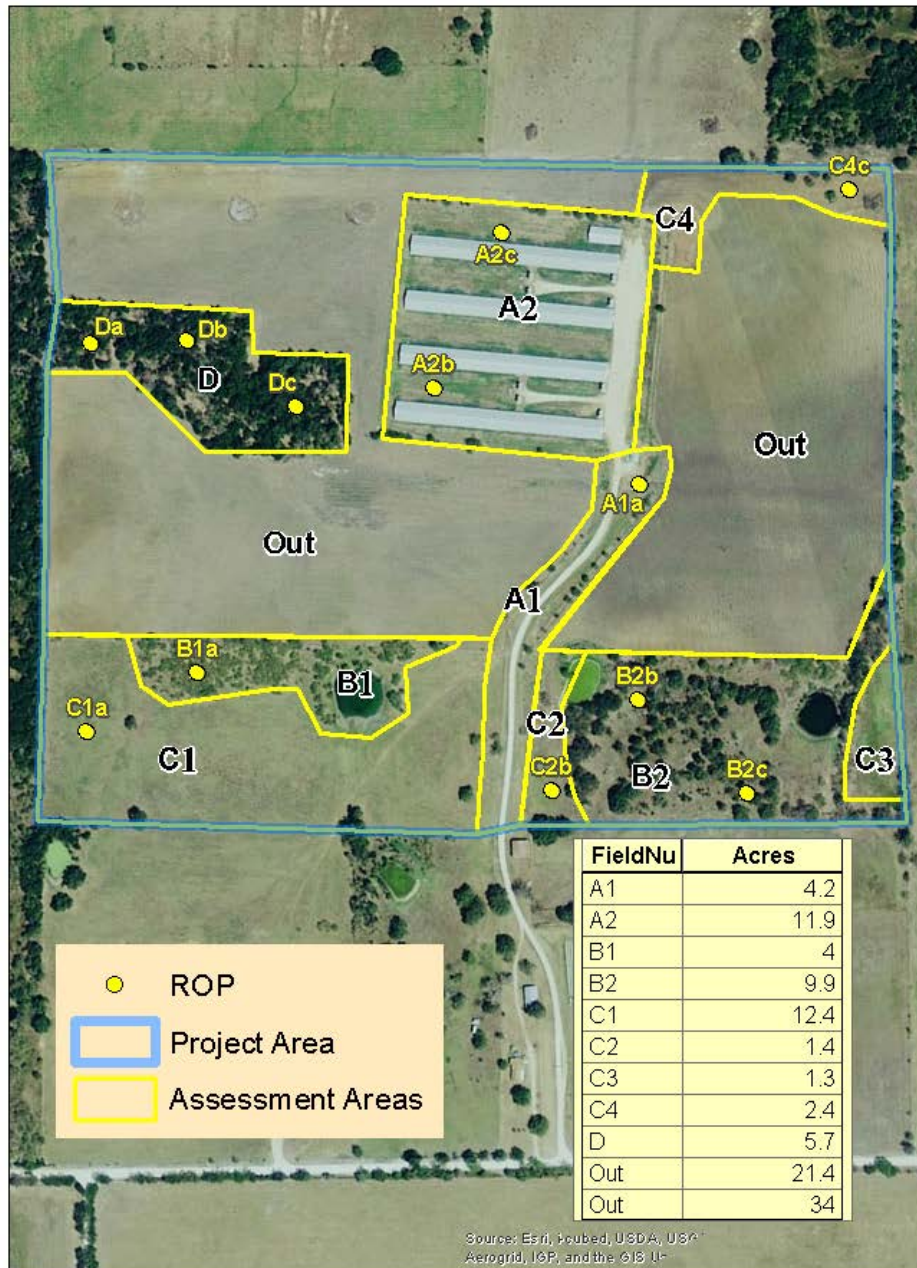


1:4,800

Map created: February 19, 2016  
 Central National Technology Support Center  
 USDA-NRCS, Fort Worth, Texas  
 Map No. 2016- 25

Figure 1: Example of a monarch habitat development base map for a less complex project. Note the concept that an assessment area need not be contiguous. This assessment area (A) is divided into two subareas (A1 and A2). ROP denotes Representative Observation Point.

## Monarch Butterfly Habitat Base Map



1:4,800

Map created: February 29, 2016  
 Central National Technology Support Center  
 USDA-NRCS, Fort Worth, Texas  
 Map No. 2016-28

Figure 2: Example of a monarch habitat development base map for a complex project. Note the concept that an assessment area need not be contiguous. As an example, the open herbaceous assessment area C has four subareas (C1, C2, C3, and C4). ROP denotes Representative Observation Point.



**STEP 2: Rapid Screening of Poor Value Monarch WHEG Plant Community Types<sup>1</sup>.**

- a. Determine the Monarch WHEG plant community type and document the decision on the data sheet(s) for the assessment area.
  - i. *CROP* – Any area that is being annually planted for harvest of a product.
    - A. **Document a benchmark condition rating of *poor* and end the assessment of benchmark habitat conditions on the datasheet.**
    - B. If any of the planning considerations below are an objective of the decision maker, continue to Step 4.
      - o Alternatives and Planning Considerations:
        - Conservation Cover (327), with an additional criteria to “enhance wildlife, pollinator and beneficial organism habitat,” with the monarch as the target wildlife species.
        - Integrated Pest Management (595), with the purposes of
          - Prevent or mitigate offsite pesticide risks to soil, water, air, plants, animals and humans from drift and volatilization losses, with the monarch being the target animal and monarch larval and/or nectaring forbs being the target plants. Consider drift/movement of insecticides (spray or planter dust with seed treatments).
          - Prevent or mitigate on-site pesticide risks to pollinators and other beneficial species through direct contact, with monarchs being the target species. The decision maker may opt to implement a *125-foot pesticide-free buffer* around the entire AA or area encompassing all implemented practices. *Note: These restrictions do not apply to activities intended to establish or maintain the AA as productive monarch breeding habitat.*
  - ii. *INTENSIVELY MANAGED HAY or INTENSIVELY MANAGED PASTURE (including farmsteads and other frequently-managed OR low diversity grass stands)* - These areas support primarily monotypic or low diversity grass and livestock forage species.
    - A. **Document a benchmark condition rating of *poor* and end the assessment of benchmark habitat conditions on the datasheet.**
    - B. If any of the planning considerations below are an objective of the decision maker, continue to Step 4.
      - o Alternatives and Planning Considerations:
        - Conservation Cover (327) or Field Border (386) with an additional criteria to “enhance wildlife, pollinator and beneficial organism habitat”, with the monarch as the target wildlife species.
        - Prescribed Burning (338) or Early Successional Habitat Development / Management (647) or Herbaceous Weed Control (314), if needed, with improve wildlife habitat as at least one of the purposes and the target habitat conditions of an increase in the forb component.
        - Integrated Pest Management (595), with the purposes of:
          - Prevent or mitigate offsite pesticide risks to soil, water, air, plants,

<sup>1</sup> Monarch WHEG plant community types are related specifically to this WHEG and should not be confused with the term “landuse” in the NRCS National Conservation Planning Manual or program guidance.

animals and humans from drift and volatilization losses, with the adult monarch and larva being the target animal and/or nectaring forbs, including milkweed, being the target plants. Consider drift/movement of pesticides (spray or planter dust with seed treatments).

- Prevent or mitigate on-site pesticide risks to pollinators and other beneficial species through direct contact, with monarchs being the target species. The decision maker may opt to implement a *125-foot pesticide-free buffer* around the entire AA or area encompassing all implemented practices. *Note: These restrictions do not apply to activities intended to establish or maintain the AA as productive monarch breeding habitat.*

- iii. **INVASIVES SPECIES DOMINATE** – These areas support woody vegetation (brush) or other invasive species at a density that eliminates milkweed and monarch nectar species. The planner and decision-maker agree that invasive species must be addressed prior to implementation of any other monarch habitat efforts. Woody: mesquite juniper herbaceous: knapweed, leafy spurge, cheat grass,

- A. **Document a benchmark condition rating of *poor* and end the assessment of benchmark habitat conditions on the datasheet.**

- B. If any of the planning considerations below are an objective of the decision maker, continue to Step 4.

- o Alternatives and Planning Considerations: Monarch habitat would require Herbaceous Weed Control (315) or Brush Management (314), followed by the consideration of other alternatives such as:
  - Prescribed Burning (338) or Early Successional Habitat Development / Management (647) or Brush Management (314) or Herbaceous Weed Control (315), if needed, with improve wildlife habitat as at least one of the purposes and the target habitat conditions of an increase in the forb component.
  - Conservation Cover (327) or Field Border (386) or Riparian Herbaceous Cover (390) with an additional criteria to “enhance wildlife, pollinator and beneficial organism habitat”, with the monarch as the target wildlife species. Note, that invasive species need to be under control before planting monarch habitat cover.

**STEP 3: Follow instructions on Western Monarch WHEG datasheet to determine and assign ratings for the subset of the other AAs with a land type of *Other Herbaceous Plant Communities***

- i. **OTHER HERBACEOUS PLANT COMMUNITIES** – These areas support native and non-native grasses and may have a significant forb component. They may have past cropping or grazing history. Past cultural practices (e.g. cropping) may have changed the soil (structure, organic matter, biology) and microtopography such that the site’s potential to support a rich mix of native herbaceous species is reduced. There may be some woody encroachment, but not to the level to warrant a landtype of *Brush*.

- A. **Document the benchmark habitat conditions on the datasheet.**

**STEP 4:** Collect information concerning use of herbicides and insecticides by interviewing the client. Record it in the data sheet (see datasheet page 2).

**STEP 5:** Determine the amount of milkweed present in the assessment area by conducting a .01 acre belt transect within the assessment area (see datasheet page 3). For large areas with greater variations conduct multiple belt transect and average the results. See USDA – ARS Jornada Experimental Range Monitoring Manual for detail instruction on conducting a belt transect.

**STEP 6:** Estimate the percent cover and number of different nectaring plants in the assessment areas (see datasheet page 4). Line-point intercept can be used to actually measure these factors if that is desirable. See USDA – ARS Jornada Experimental Range Monitoring Manual for detail instruction on conducting line point intercept.

**STEP 7:** Enter data into the formula and determine the baseline condition (see datasheet page 5). Future cast the impacts of conservation practices applied and determine the after score. To meet minimum criteria, final score needs to be good or excellent.

## RESOURCES

Milkweed and Monarchs in the Western United States [http://www.xerces.org/wp-content/uploads/2015/06/MonarchsandMilkweed-websec\\_May29.pdf](http://www.xerces.org/wp-content/uploads/2015/06/MonarchsandMilkweed-websec_May29.pdf)

Milkweed guides. <http://www.xerces.org/milkweed/>

Western Milkweed Survey. <http://www.xerces.org/milkweedsurvey/>

State of the Monarch Butterfly Overwintering Sites in California. 2016. [http://www.xerces.org/wp-content/uploads/2016/07/StateOfMonarchOverwinteringSitesInCA\\_XercesSoc\\_web.pdf](http://www.xerces.org/wp-content/uploads/2016/07/StateOfMonarchOverwinteringSitesInCA_XercesSoc_web.pdf)

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