RIGHTS-OF-WAY AS HABITAT WORKING GROUP

POLLINATOR SCORECARD

V 2.0 – 2019 EDITION

ROW HWG

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Introduction

The Rights-of-Way as Habitat Working Group Metrics & Targets Task Force proudly presents the Pollinator Scorecard. The Pollinator Scorecard allows rights-of-way managers to describe the pollinator habitat on the lands they manage. A common definition of pollinator habitat, coupled with a consistent methodology for evaluating pollinator habitat and management, will allow collaboration between Rights-of-Way as Habitat Working Group members to support pollinator habitat on rights-of-way.

The purpose of the Pollinator Scorecard is to:

- Provide a **common language** to talk about habitat on energy and transportation lands in order to facilitate industry learning and collaboration
- Establish a **consistent valuation** method across rights-of-way sectors that aligns with existing habitat assessments and reporting
- Provide a **flexible, multi-tiered approach** that encourages improved monitoring over time
- Support **shared reporting** of habitat metrics across industries

The Pollinator Scorecard may also be used to meet the monitoring requirements for organizations participating in the Candidate Conservation Agreement with Assurances (CCAA) for the monarch butterfly.

What is Pollinator Habitat?

For the purposes of the Pollinator Scorecard, pollinator habitat is defined as:

> **Pollinator habitat contains native flowering plants, host plants, and nesting sites, throughout the growing season.**

Pollinator habitat may be remnant natural habitat, habitat enhanced through management, or newly created habitat. Flowering plants are important because they provide floral resources including nectar and pollen to pollinators. A greater diversity of (or dominance by) native plants provides a greater diversity of floral resources and host plants (such as for butterflies) and nesting sites (such as for native bees). While non-native plants may provide some resources for pollinators, native plants provide other ecosystem services including soil stabilization, water quality improvements, and habitat for birds and other wildlife, and are persistent and typically less costly to maintain for long-term sustainability. A healthy pollinator habitat is commonly defined as having three or more native plant species in bloom during each of the spring, summer, and fall periods, as applicable by region.

What Does the Pollinator Scorecard Do?

The Pollinator Scorecard evaluates habitat quality and the compatibility of management on pollinator habitat. The Pollinator Scorecard includes two components:

(1) **Pollinator Habitat Assessment Protocol:** used to collect data on pollinator habitat attributes in the field
(2) **Pollinator Management Module:** used to evaluate the extent to which management protects pollinator habitat from threats and leverages opportunities to promote pollinator habitat.

The Pollinator Scorecard is designed for flexibility with an understanding that rights-of-way managers may have different objectives for using the Pollinator Scorecard and varying levels of access to resources and expertise for pollinator habitat assessment. Therefore, the Pollinator Scorecard was designed with a multi-tiered approach to support all rights-of-way managers in habitat evaluation (Table 1).

Table 1. Overview of the multi-tiered approach of the Pollinator Scorecard

	Tier 1: Basic	Tier 2: Qualitative	Tier 3: Detailed
Information Gained	Is habitat for pollinators present?	What is the quality of pollinator habitat?	What is the composition (by plant species) of the pollinator habitat?
Metrics	▪ Flowering nectar plant cover ▪ Milkweed presence ▪ Pollinators observed	▪ Flowering nectar plant cover ▪ Abundance of milkweed ▪ Currently blooming nectar plants ▪ Additional habitat features ▪ Threats and opportunities	▪ Flowering nectar plant cover ▪ Flowering nectar plant richness (native and non-native) ▪ Abundance of milkweed ▪ Additional habitat features ▪ Invasive/noxious weed cover ▪ Threats and opportunities
Level of Effort	5 – 10 minutes per plot	10 – 20 minutes per plot	20+ minutes per plot
Qualifications Needed	Some familiarity with pollinator habitat or minimal training	Ability to distinguish nectar plants and count milkweed	Ability to identify plants to species level
Outcome	"Yes/No" habitat determination	Qualitative rating of pollinator habitat and management score	Qualitative rating of pollinator habitat; list of species present and metrics per species for nectar plants, milkweed, and invasive/noxious weeds; and management score

In both Tier 2 and Tier 3, information is collected on the threats and opportunities for use in the Pollinator Management Module. See the *Pollinator Management Module Protocol* for instructions on using the management module.

Who Uses the Pollinator Scorecard?

The Pollinator Scorecard includes multiple tiers to allow users of differing training and experience levels to evaluate pollinator habitat (see Table 1, above). The Pollinator Scorecard, as a package, is primarily intended for rights-of-way managers. Different users may use different components of the Pollinator

Scorecard for a single site. For example, the rights-of-way manager may use student interns to complete the Pollinator Habitat Assessment Protocol and complete the Pollinator Management Module themselves. The Pollinator Management Module must be used by someone familiar with the management of the site (see the *Pollinator Management Module Protocol* section for more specific requirements). The qualifications required to use the Pollinator Habitat Assessment Module will differ by tier:

- **Tier 1:** Tier 1 is intended for anyone with minimal training. Required qualifications include the ability to:
  - recognize potentially flowering nectar plants (e.g., wildflowers and shrubs);
  - estimate percent cover of potentially flowering nectar plants sufficiently to distinguish between plots with greater than 10% cover and less than 10% cover; and
  - recognize milkweed plants.
- **Tier 2:** with some training, Tier 2 may be used by most users. Required qualifications include the requirements of Tier 1 users as well as the ability to:
  - estimate percent cover within broad bins (e.g., 6 – 10% cover, 10 – 25% cover, etc.);
  - recognize flowering plants currently in bloom;
  - recognize habitat resources used by pollinators (e.g., brush piles, basking areas); and
  - identify management threats and opportunities (if using the Pollinator Management Module).
- **Tier 3:** Tier 3 is intended for more advanced users. Required qualifications include the requirements of Tier 2 users as well as the ability to:
  - Identify most plants to species, especially native and non-native nectar plants.

Tiers 1 and 2 are intended to be used by anyone, but note that successfully completing a Tier 2 assessment requires more training and time than a Tier 1 assessment. Tier 3 should only be used by those with some botany experience.

Where Can the Pollinator Scorecard Be Used?

The Pollinator Scorecard may be used to evaluate pollinator habitat and management on rights-of-way and other lands for multiple sectors within the contiguous United States. Managers may use the Pollinator Scorecard anywhere they wish to describe pollinator habitat, whether or not there is known pollinator habitat present. The scorecard may also serve as a tool in areas being considered for enhancement by management. Or, users may like to use the scorecard when they encounter pollinator habitat while monitoring rights-of-way corridors for routine vegetation management, stopping periodically to characterize a segment of corridor.

To evaluate a specific site, the rights-of-way manager must first delineate the boundaries of the assessment area and then distribute plots within that perimeter in a random or systematic way. A **site** is the area in which the manager is interested in characterizing habitat. A **plot** is a 1,500 square foot rectangle or circle in which

Sites & Plots – Definitions

Site – The area over which the rights-of-way manager is interested in characterizing habitat. Sites may range from a single pollinator planting to an entire right-of-way corridor.

Plot – a 1,500 square foot area within which an assessment is conducted. Plots must be a 150 x 10 foot rectangle or 22 foot radius circle. Multiple plots are used to characterize a site.

data are collected. Multiple plots are used to characterize a site. Detailed instructions for distributing plots are provided in the *Pollinator Habitat Assessment Protocol* section.

The number and frequency of plots used will be dictated by the manager's objectives for using the Pollinator Scorecard. The more plots used, the greater the 'resolution' of data on pollinator habitat in any site and thus the more useful the assessment will be in characterizing the site and informing management. As site size increases, the number of plots sampled should also increase, in general. Higher variability within the site will require more plots to have confidence that the site was accurately characterized. Also consider the spacing between plots—the less distance between plots, the less uncertainty in the habitat quality between the plots, in general. Statistical methods can be used to more accurately calculate the number of plots required for any site[1].

In some circumstances, managers may wish to use a 'representative' plot to characterize a site. Representative plots are placed subjectively in a place that best represents the habitat according to the judgement of the assessor. Representative plots can provide a rapid characterization of a specific, small site, but are generally not appropriate for larger sites (e.g., greater than 1 acre in size). Data from representative plots should not be pooled with data from randomly or systematically placed plots to characterize larger areas.

Alternative Assessment Protocols

The Pollinator Scorecard was developed after careful review of many similar assessment methods for pollinator habitat. It's important to note that the Pollinator Scorecard may not be the best method for assessing pollinator habitat, depending on the manager's objectives and the specific attributes of the site. For example, state solar scorecards may be better suited for assessing pollinator habitat in solar facilities and the Integrated Monarch Monitoring Protocol may be best for detailed evaluation of monarch habitat specifically.

When Should the Pollinator Scorecard Be Used?

The Pollinator Scorecard was designed with an understanding that rights-of-way managers are generally unable to visit sites multiple times per year due to resource constraints. Thus, the Pollinator Scorecard is designed to provide a reasonable representation of the site with a single visit. However, to understand the value of a site for pollinators, what is needed is information regarding the availability of nectar for pollinators throughout the year. Therefore, we collect information for all 'Potentially Flowering Nectar Plants,' which include wildflowers (forbs) and flowering shrubs (i.e., excluding grasses), that could provide nectar to pollinators, regardless of whether or not those plants are blooming on the date of assessment and whether the plants are considered weedy. 'Potentially Flowering Nectar Plants' are defined as:

> **Potentially flowering nectar plants are plants that exhibit signs of currently blooming, or have just bloomed, or soon to be blooming. This would include all broadleaf plants (e.g., wildflowers and flowering shrubs) that are not grasses, rushes, sedges or ferns.**

The site should be evaluated during peak blooming season, which will vary by region. Some regions, especially hotter and drier regions of the U.S., will experience two peak blooms per year, in which case

[1] See the reference *Measuring & Monitoring Plant Populations* published by the Bureau of Land Management, U.S. Department of Interior for an approachable treatment of this topic.

managers may wish to evaluate a site twice per year. Ideally, all plots will be collected within a brief window of time (e.g., within a few weeks), which will allow better comparisons of habitat across sites. The Pollinator Scorecard may be used multiple times per year on the same site if desired.

To evaluate changes over time, managers may wish to revisit specific plots in subsequent years. If possible, the same plot locations should be revisited. If use of permanent markers is not feasible, collect plot location information as accurately as possible, either with a GPS unit or through clear description of the plot location in reference to permanent landmarks.

The Pollinator Management Module may be completed at any time of year following the site assessments.

How Long Does It Take?

The length of time required for site assessments depends on the size of the site and the number of plots sampled. Time to collect data within each plot depends on the protocol tier, and ranges from less than five minutes to 20 minutes or more. Also consider the time required to travel between plots when collecting multiple plots.

As an example, evaluating a one-mile length of right-of-way with vehicle access using five plots and the Tier 2 protocol may require 75 minutes of assessment time (15 minutes per plot) plus 50 minutes of driving time (10 minutes between plots) for a total of approximately 3 hours. Note that total times may vary significantly based on a number of factors—with some experience managers will better understand the time required for their needs, and assessors will become faster at data collection.

What Information Does the Pollinator Scorecard Provide?

The Pollinator Scorecard will provide information on the location and abundance of pollinator habitat as well as the suitability of management on pollinator habitat.

Habitat Quality Ratings

After completing the Pollinator Habitat Assessment Protocol for Tier 2 and 3, a habitat quality rating is provided for each plot. Habitat quality ratings are described in Table 2.

Table 2. Habitat Quality Ratings and Interpretation

Rating	Point Range	Interpretation
Improvement Opportunity	0 - 5	Pollinator habitat is either not present or very limited. Consider creation of habitat for pollinators if opportunities exist.
Available Habitat	6 - 10	Some components of pollinator habitat are present but limited. Consider enhancement through revegetation or changing vegetation management.
Supporting Pollinators	11 - 20	The habitat is capable of supporting pollinators. Habitat may be enhanced or maintained, depending on opportunities present.
Robust Habitat	20+	High-quality habitat is present. Focus on maintaining habitat quality.

The Tier 3 protocol will provide more accurate habitat quality ratings than the Tier 2 protocol due to the additional information available for scoring with the Tier 3 protocol. In addition, the total number of points possible for Tier 3 is greater than Tier 2 to emphasize the level of effort and accuracy of using the Tier 3 protocol. However, in general, Tier 2 and Tier 3 should provide similar habitat quality ratings for the same site.

While rights-of-way provide an important opportunity for supporting pollinators, habitat on rights-of-way may not be as high in quality as on remnant prairie, prairie restorations, or similar areas. Thus, the ratings are tailored to provide meaningful information based on the range of habitat qualities expected in rights-of-way.

Management Ratings

The management module evaluates the suitability of management for pollinator habitat if present on each plot or site. After completing the Management Module, a management suitability rating is provided. Management suitability ratings are described in Table 3.

Table 3. Habitat Quality Ratings and Interpretation

Qualitative Ratings	Score
Exemplary	55-60
Great	43-54
Satisfactory	31-42
Some Needs Met	19-30
Needs Improvement	0-18

Combining Habitat Quality and Management Ratings

The Pollinator Scorecard provides ratings for habitat quality and management separately so that mangers can understand each component and interpret the results both individually as well as collectively when appropriate. Targeted management of low-quality habitat may result in improved habitat quality over time and may be the best that a manager can do. Conversely, unsuitable management of high-quality habitat may minimize the benefits that the habitat provides to pollinators. Both the habitat quality and management ratings should be considered together when evaluating current and potential habitat onsite.

Pollinator Habitat Assessment Protocol

This section provides step-by-step instructions for setting up and completing the Pollinator Scorecard in the field.

Materials Required

The habitat assessment may be completed with just the datasheet, clipboard, and pen/pencil in most cases. Ensure you have permission, documented as required, and safety equipment depending on the type of right-of-way to be assessed. Other items, including a GPS, measuring tape, clicker counter, and guidebooks are helpful but not required.

1. Permit or permission for access to the right-of-way from proper authority
2. Safety clothing (Type 3 vest in some states), helmet (required in some states or if desired)
3. Revolving or flashing light for top of car, if required
4. Datasheets, clipboard, pen/pencil
5. GPS unit, GPS enabled tablet, or smartphone* (for navigating to plots or collecting plot locations)
6. Measuring tape*
7. Clicker counter* (for tallying milkweed)
8. Pin flags* (for marking plot corners)
9. Plant identification guidebook or aides*
10. Pollinator identification guidebook or aides*
11. Hand lens or magnifying glass* (for identifying plant parts)

* Optional items

Habitat Assessment Instructions

Follow the instructions below to complete a habitat assessment using the Pollinator Scorecard.

H-1. Set Up Site Assessment

H-1.1. **Define the boundaries of the site to be assessed:** The site is the area within which the manager is interested in characterizing habitat. It may range in size from a single pollinator planting to an entire right-of-way (ROW) corridor.

For linear ROWs, note the beginning and ending points of the site to be assessed. For non-linear features, define the polygon representing the area of interest on an aerial map of the site.

Plots will be distributed within the site boundaries.

H-1.2. **Estimate the site area:** The area of the site will inform the number of plots required as well as permit calculation of other parameters, such as the abundance of milkweed within the site, from plot-scale data. Note the site area, it will be recorded on the datasheet.

H-1.3. **Determine the number of plots required:** The number of plots required will depend on the objectives of the assessment and resources available.

H-1.4. **Distribute the plots over the site:** First, determine whether plots will be distributed randomly, systematically, or representatively:

- **Random** plot locations are best for large, non-linear sites. Use a GIS or random number generator to generate point locations within the site that will serve as the starting corner locations for plots. Load those plot locations into a GPS unit, if available, or mark on an aerial image of the site. Random plot locations allow for characterization of very large sites.
- **Systematic** plot locations—in which plots are taken at set intervals along a ROW—are ideal for long, linear ROWs. Simply specify a starting location along the ROW, a distance from the feature to begin the plots, and a distance to travel between plots such that the number of plots desired will be collected (e.g., start at mile marker 8, 12 feet from the centerline, and collect plots every quarter mile). Systematic plot locations also allow for characterization of very large sites.
- **Representative** plots may be used when a specific, small patch of habitat is being assessed. Note that representative plot data generally should not be used for large sites (greater than 1 acre in size) and should not be pooled with random/systematic data to characterize larger sites.

H-2. Record Site Data

H-2.1. **Record site data on the datasheet:** Record the Site Name, ROW Organization, Assessor Name, Assessor's Affiliation, Site Area (in acres), and Survey Type on the top of the datasheet. If step H-1 was completed in the office and multiple plots will be collected for the site, you may wish to pre-fill this information before printing field datasheets.

H-3. Collect Plot-Scale Data

H-3.1. **Navigate to the first plot:** Using the plot location information created during step H-1.3, navigate to the first plot location. If using a representative sample, plot location will not be provided. Instead, identify an area that represents the site and begin the plot there.

H-3.2. **Record plot data on the datasheet:** Observe the plot from the starting point and record the plot number and plot corner location (as latitude/longitude coordinates (preferred) or in relation to permanent landmarks). Provide a brief description of the plot, including the type of ROW and ownership status (i.e., owned or easement).

H-3.3. **Take photos:** Take photos of the plot and record the photo number or other identifying information on the datasheet such that photos may be matched with the corresponding plots in the office. This step is optional but highly recommended.

H-3.4. **Establish the plot:** The plot will be a 1,500 square foot area. Use a rectangular plot 150 x 10 ft if possible, otherwise use a 22 ft radius circle.

If using a rectangular plot on a ROW corridor, orient the long side of the plot parallel, perpendicular, or diagonal to the ROW (or spin a pen/pencil to obtain a random direction if the site is not a linear ROW). Consider orienting the long axis of the plot

across the width of the corridor to encompass the greatest expected variation in the vegetation. Note your starting position (use a pin flag if desired) and walk the 150 ft length of the plot along its edge to the opposite end. When first beginning assessments, observers should use a measuring tape to measure 150 ft, once calibrated, observers can pace.

H-3.5. **Record the primary adjacent land uses (optional in Tier 1):** Record the land use type directly adjacent to the ROW that borders the majority of the length of the 150 ft plot. If different land use types are located on either side of the ROW, select up to two adjacent land uses per plot (one for each side of the ROW). If multiple land uses are adjacent to the plot on one side of the ROW, select the dominant land use type. See Table 5 for land use definitions.

H-3.6. **Record habitat attribute scores:** Return to the starting point of the plot using a meandering or zig-zag pattern, observing habitat attributes within the plot (Figure 1). Attributes will vary by tier. See Table 4 *Attribute Definitions* (below) for definitions of each attribute. Note that Tier 3 also includes a Plant Species Worksheet that should be completed.

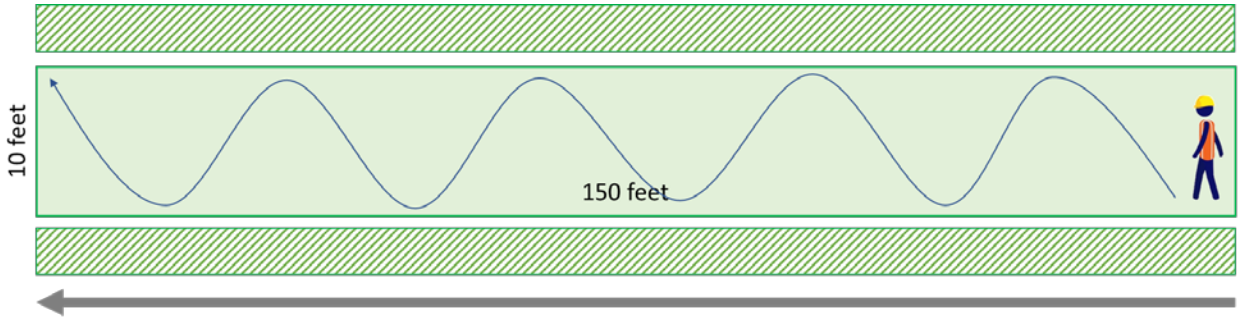

Figure 1. Illustration of a meandering walk through 150 x 10 ft plot (plot not drawn to scale).

H-3.7. **Calculate a plot score (Tier 2 & 3 only):** Each habitat attribute is associated with a number of points (in curly braces '{ }'). Record the points for each attribute, then total the points to calculate Total Points. The total points can be translated to a qualitative rank for the plot, see guidance on the datasheet.

H-3.8. **Repeat for additional plots:** Repeat the above process, navigating to the plot, recording plot data, taking photos, establishing the plot, recording habitat attributes, and scoring the plot for each plot assessed.

Table 4. Attribute Definitions

		Tier 1	Tier 2	Tier 3
Site Information				
Site Name	A unique identifying name for the site	●	●	●
ROW Organization	The organization responsible for managing the site	●	●	●
Assessor	The name of the assessor(s) (your name(s))	●	●	●
Assessor's Affiliation	The organization name(s) of the assessor(s)	●	●	●
Site Area (acres)	The size in acres of the site (see step H-1.2)	●	●	●
Date	The date of the assessment	●	●	●
Survey Type	Indicate whether plots were distributed in a random/systematic or representative way	●	●	●
Plot Information				
Start Time	The start time for plot assessment	●	●	●
Plot Number	A unique identifier for the plot	●	●	●
Plot Location	The coordinates of the plot and/or sufficient information to re-identify the plot in subsequent visits	●	●	●
Plot Description	A general description of the plot, including the type of right-of-way it is located in, the ownership status (owned or easement), etc.	●	●	●
Photos	Photo names, numbers or other identifying information	●	●	●
Adjacent Land Uses	The land use type directly adjacent to the of right-of-way that borders the majority of the length of the 150 ft plot. If different land use types are located on either side of the of right-of-way, select up to two adjacent land uses per plot (one for each side of the of right-of-way). If multiple land uses are adjacent to the plot on one side of the of right-of-way, select the dominant land use type. See Table 4 for adjacent land use definitions	o	●	●
Habitat Attributes				
More than 10% cover potentially flowering nectar plants?	Indicate 'yes' if the plot contains more than 10% cover of potentially flowering nectar plants (e.g., wildflowers and shrubs), whether flowering or not	●		
More than 2 milkweed plants present?	Indicate 'yes' if the plot contains more than 2 milkweed plants	●		
Potentially Flowering Nectar Plant Cover	Estimate the percent cover of potentially flowering nectar plants (e.g., wildflowers and shrubs), whether flowering or not; select the appropriate category.		●	●

		Tier 1	Tier 2	Tier 3
Additional Habitat Resources	Check any habitat resources that are present. If unsure, note what was observed.	o	•	•
3 or more flowering nectar plants currently in bloom?	Indicate 'yes' if 3 or more distinct types of flowers were observed. Distinct types of flowers means flowers of different wildflower or shrub species.		•	
Abundance of milkweed	Count the number of milkweed plants observed in the plot. In addition to Asclepias species, also include honeyvine, *Cynanchum laeve*. Count a plant as a single stem (e.g., common milkweed, *Asclepias syriaca*, ignoring possible below ground connections); or a plant may be multiple stems originating from the same central location in the soil (e.g., green antelope horn, *A. asperula*, or butterfly weed, *A. tuberosa*). For honeyvine, it will likely be necessary to estimate number of plants. Use the Plant Species Worksheet (Tier 3 only).		•	•
Number of Nectar Plant Species	Count the number of unique nectar plant species identified in the plot; select the appropriate category. Use the Plant Species Worksheet.			•
Number of Native Nectar Plant Species	Count the number of unique native nectar plant species identified in the plot; select the appropriate category. Use the Plant Species Worksheet and note how the status of a plant as native was determined (e.g., USDA plant lists).			•
Invasive Species & Noxious Weed Cover	Estimate the percent cover of invasive species and noxious weeds in the plot. Use the Plant Species Worksheet and note how the status of a plant as noxious or invasive was determined (e.g., county noxious weed list).			•
Pollinators Observed	Check for any pollinators observed while surveying the plot. Pollinators need not be located within the plot to be counted.	o	•	•
Threats	Check for any threats identified on or adjacent to the plot. If other, describe.	o	•	•
Opportunities	Check for any opportunities identified on or adjacent to the plot. If other, describe.			

Key: • required; o optional

Table 5. Adjacent Land Use Descriptions

Cropland	Currently or recently used for agricultural production. Will vary by region. Excludes Conservation Reserve Program and other agricultural set-asides.
Developed	Includes pavement, buildings, lawn, landscaping and other features associated with urban, suburban, or ex-urban development.
Woodland	Woody or brush-dominated.
Wetland	Areas characterized by standing water during parts of the year and associated with wetland vegetation (e.g., cattails, rushes).
Grassland (Diverse)	Includes native or restored grassland or prairie remnant, wildlife areas, etc., and CRP with bunchgrasses and forbs present.
Grassland (Non-diverse)	Includes open space, heavily grazed lands, hayfields, recreation fields, golf courses, and CRP dominated by a single grass species.

Questions

Questions regarding the Habitat Assessment Protocol? Contact Erik Anderson at eanderson@enviroincentives.com.

Pollinator Management Module Protocol

Rationale

Managing for habitat involves actions directed towards either:

a) Minimizing threats that may impact the condition (or availability of) habitat, and/or
b) Enhancing opportunities to improve habitat elements that can benefit a species.

Threats can degrade habitat quality or result in loss of habitat altogether. Managing against threats helps sustain habitat conditions in their current state. In addition to threats, enhancement opportunities help maximize specific qualities of habitats. These opportunities may typically include, but are not limited to adding nesting cover, adding specific host plants, enhancing niche requirements, or other needs. These often occur across a range of intensity or scale at any given site (Figure 2).

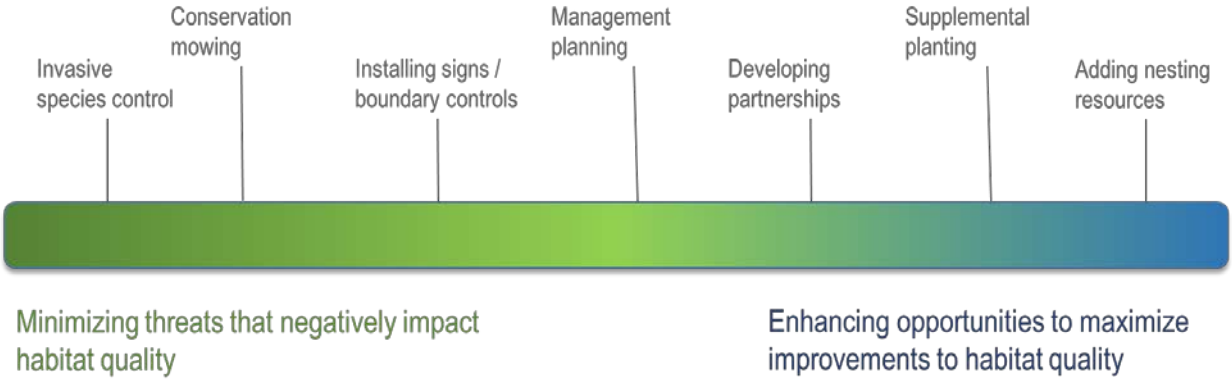

Figure 2. Habitat Management Threats-Opportunities Spectrum

The Management Module is an assessment tool used to identify threats and opportunities present at a site, document the management actions taken to minimize threats and maximize opportunities, and evaluate the broad efficacy of those management actions. While the management module cannot account for all factors influencing the success of a particular management action, it does assess the general effectiveness of the action taken based on factors generally within the control of the manager (i.e., the scale and persistence of the actions taken). Actions taken that address the full threat or opportunity within the entirety of a site are more effective than those that only partially address the threat/opportunity or a portion of the area. Similarly, actions that will have a lasting improvement on the site (i.e. years versus months), are considered to be more effective. Therefore, management actions that address threats or opportunities thoroughly across the site being managed, and with a long-term response, are considered more effective than actions that only affect a smaller proportion of the area in need, or that have a marginal or short-term response (Figure 3).

Scale and Persistence – Definitions

Scale – The percentage of the site managed to address a particular threat or opportunity during a single treatment, or action.

Persistence – The length of time that the management action is anticipated to have a lasting effect on the threat or opportunity.

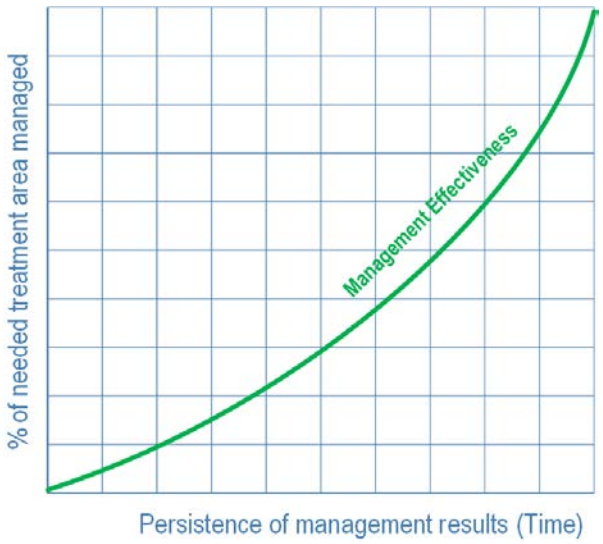

Figure 3. Conceptual Relationship between Habitat Management and Effectiveness

The Management Module's purpose is to accompany a site where habitat condition has been assessed using the Pollinator Habitat Assessment Protocol. It is separate from the Pollinator Habitat Assessment because management is often site-specific and dependent on habitat quality. Similarly, the scale of management may encompass a site represented by several plots. The Management Module and Pollinator Habitat Assessment generate separate scores to better understand how management and habitat quality affect each other. The separate scores can be used to inform site decisions and evaluate how well a site's management is addressing the needs of the habitat.

Who Completes the Management Module?

The Management Module must be completed by a knowledgeable individual who has:

- Familiarity with the site being evaluated,
- Information available to make reasonable judgements regarding site conditions and management actions, and
- A working knowledge of habitat management actions typically conducted by their organization.

How Many Management Module Evaluations Do I Complete for a Site?

The Management Module should be used to evaluate how well-aligned management efforts are with the habitat threats and opportunities present at a particular site. In situations where management occurs similarly across a site, one Management Module should be used to evaluate those actions. If a site utilizes different management approaches within the site (i.e., typically if the site is very large, complex, or segmented into sub-units), then more than one Management Module may be completed as appropriate. As a result, several Scorecard plots may be tied to a single Management Module evaluation.

Management Module Instructions

M-1. Set-up Site Assessment

M-1.1 **Compile and review site information.** This can include photos, the relevant Scorecard plot datasheet(s), and other relevant site assessments.

M-1.2 **Identifying Information.** Using information gathered onsite, or from knowledge of the Pollinator Scorecard plot location, complete the identifying information at the top of the module scoring sheet (i.e. Assessor, Date, Site ID, and so on).

M-2. Threats Managed

M-2.1 **Determine whether "manageable" threats are present at the site.** If none are present, select "No" in response to the "Threats Present?" in the dark green top row of the Threats Managed Table.

M-2.1.1 If "No" is selected, then do not complete any other portions of the threats managed section. A site without additional threats receives full points available for this portion of the module.

M-2.1.2 Since most sites contain at least one threat, the table defaults to "Yes". If "Yes" is appropriate for this site, proceed with completing Part 1. Threats Managed according to the following instructions.

M-2.2 **Select which "manageable" threats are present at the site.** Commonly encountered manageable threats are listed in the first column. These can be changed according to user preference; however, the accompanying drop-down lists may not correspond to the newly added threat(s).

In the second column, select "Yes" from the drop-down menu if the threat is present on the site being evaluated, or "No" if the threat is not present.

M-2.3 **For manageable threats present, determine which threats were managed over the past calendar year.**

M-2.3.1 In the third column (labeled "Recommended Actions"), select the most applicable management action from the drop-down menu, or select "Other" if a management action is not listed in the

What is a "manageable" threat or opportunity?

A threat or opportunity would be considered "manageable" if it meets the following criteria:

- An effective treatment is feasible and site conditions allow for the treatment opportunity (i.e. "We can do something here to improve…")
- The treatment is appropriate and targeted (i.e. the action will directly remediate the threat, or improve this habitat element.)
- No other constraints prevent the activity from being considered (i.e. the action is not constrained by regulatory constraints, land ownership, or easement restrictions)

drop-down menu and describe the action in the “Notes” column.

M-2.3.2 In the fourth column (labeled “Recommended Actions Taken Over the Past Year”), select “Yes” if the recommended management action has been conducted over the past calendar year, or “No” if the action has not been taken.

M-2.4 **Scale of Treatment Impact.** In the fifth column (labeled “Scale of Treatment Impact”), assign the degree of scale of the action taken within the area represented by the Pollinator Scorecard plot that calendar year. Some management actions may only address a portion of the threat where its located. Others may address it across the entire area under management consideration. Using the drop-down menu, select the option that best describes how much of the managed area represented by the plot is affected (or treated) by the action:

- Affects the entirety of managed area represented by plot (>90%)
- Affects the majority of area represented by plot (50-90%)
- Affects the minority of area represented by plot (<50%)

M-2.5 **Persistence of Treatment Effects.** In the sixth column (labeled “Persistence of Treatment Effects”), assign the degree of persistence for the action taken that calendar year. Some management actions may result in short-term effects or resolution before the threat returns. Other actions may have a long-term, or persistent, effect or resolution. Using your knowledge of the site and management action conducted, select the option from the drop-down menu that best describes the amount of time for which the management action will be effective for:

- Action results in long-term improvements (≥4 years)
- Action results in limited, short-term improvements (1-3 years)
- Action results in seasonal improvements (<1 year)
- Marginal improvements or status quo maintained

M-2.6 **Quantitative Effectiveness.** The Management Module automatically assigns qualitative and quantitative effectiveness scores.

M-2.7 **Repeat for other threats and actions completed.**

M-2.8 **Threats Managed Score.** At the bottom of the Threats Managed Table, the “Percent of Threats Managed” and the resulting “Threats Managed Score” are summarized. The score is calculated by taking the sum of threats present compared to the threats managed, and multiplied by their effectiveness. The resulting percentage is then applied to the total points possible for this section, which yields the “Threats Managed Score”.

M-3 Opportunities Implemented

M-3.1 **Determine Available Opportunities:** Determine whether “available” opportunities are present at the site. If none are present, select “No” in response to the “Opportunities Present?” in the dark green top row of the Opportunities Managed Table.

M-3.1.1 If “No” is selected, then do not complete any other portions of the opportunities managed section. A site without additional opportunities receives full points available for this portion of the module.

M-3.1.2 Since most sites contain at least one enhancement opportunity, the table defaults to “Yes”. If “Yes” is appropriate for this site, proceed with completing Part 2. Opportunities Managed according to the following instructions.

M-3.2 **Select Available Opportunities:** Select which “available” opportunities are present at the site. Commonly encountered opportunities are listed in the first column (labeled “Enhancement Opportunity”). An opportunity is considered "available" if it meets the same criteria as for actions taken to address threats, feasibility, appropriateness, and not prevented by constraints. In the second column, select “Yes” from the drop-down if the opportunity is available on site or “No” if the opportunity is not present.

M-3.3 **For available opportunities present, determine which of those were managed over the past calendar year.**

M-3.3.1 In the third column (labeled “Recommended Actions”), select the most applicable management action from the drop-down menu, or select “Other” if a management action is not listed in the drop-down menu and describe the action in the “Notes” column.

M-3.3.2 In the fourth column (labeled “Recommended Actions Taken Over the Past Year”), select “Yes” if the recommended management action has been conducted over the past calendar year, or “No” if the action has not been taken.

M-3.4 **Degree of Scale:** In the fifth column (labeled “Scale of Treatment Impact”), assign the degree of scale of the action taken within the area represented by the Pollinator Scorecard plot that calendar year. Some management actions may only address a portion of the available opportunity where its located. Others may address it across the entire area under management consideration. Using the drop-down menu, select the option that best describes how much of the managed area represented by the plot is affected (or treated) by the action:

- Affects the entirety of managed area represented by plot (>90%)
- Affects the majority of area represented by plot (50-90%)
- Affects the minority of area represented by plot (<50%)

M-3.5 **Degree of Persistence:** In the sixth column (labeled “Persistence of Treatment Effects”), assign the degree of persistence for the action taken that calendar year. Some management actions may result in short-term effects or benefits. Other actions may have a long-term, or persistent, effect or benefit. Using your knowledge of the site and management action conducted, select the option from the drop-down menu that best describes the amount of time for which the management action will be effective:

- Action results in long-term improvements (≥4 years)
- Action results in limited, short-term improvements (1-3 years)

- Action results in seasonal improvements (<1 year)
- Marginal improvements or status quo maintained

M-3.6 **The Management Module automatically assigns qualitative and quantitative effectiveness scores.**

M-3.7 **Repeat for other opportunities and actions completed.**

M-3.8 **Opportunities Managed Score:** At the bottom of the Enhancement Opportunities Table, the "Percent Managed" and "Opportunities Managed" score is summarized. The score is calculated by taking the sum of available opportunities present compared to the available opportunities managed and multiplied by their effectiveness. The resulting percentage is then applied to the total points possible for this section, which yields the "Opportunities Managed Score".

M-4 Overall Management

M-4.1 After completing both parts of the Management Module, an overall management score is summarized at bottom of the module. This score is a combination of the threats managed and opportunities managed.

M-4.6 Repeat this process for other plots or sites as necessary.

Description of Scoring

The threats and opportunities are scored in the same way. Within each chart, effectiveness scores for each individual threat and opportunity are generated from a matrix of "Scale of Treatment Impact" and "Persistence of Treatment Effects". The "Effectiveness of Action" column generates a *qualitative* score that describes to what extent the threat/opportunity has been addressed based on the user-selected scale and persistence. See the matrix below (Table 6).

Table 6. Description of Scoring

Scale (Rows) / Persistence (Columns)	Results in long-term improvements (≥4 years)	Results in limited, short-term improvements (1-3 years)	Results in seasonal improvements (<1 year)	Marginal improvements or status quo maintained
Affects the entirety of the site (>90%)	Completely addresses	Mostly addresses	Partially addresses	Minimally addresses
Affects the majority of the site (50-90%)	Mostly addresses	Partially addresses	Minimally addresses	Maintains status quo
Affects the minority of the site (<50%)	Partially addresses	Minimally addresses	Maintains status quo	None

In the next column, a corresponding *quantitative* score is generated on a 0-5 scale. Each number corresponds to a qualitative rating from the "Effectiveness of Action" column. See the Table 7 below.

Table 7. Effectiveness of Actions

Effectiveness of Action	Score
Completely addresses	5
Mostly addresses	4
Partially addresses	3
Minimally addresses	2
Maintains status quo	1
None	0

The total threats/opportunities managed score is listed at the bottom of each chart. The maximum possible score for threats managed is 35 points. There are seven possible threats that can earn up to five points each if they are completely addressed (7*5 = 35).

The maximum possible score for opportunities managed is 25 points. There are five possible opportunities that can earn up to five points each if they are completely address (5*5 = 25).

At the bottom of the Management Module, the total Management Score and Management Rating are generated. The maximum possible Management Score is 60 points (25 points from opportunities + 35 points from threats = 60 total possible points). The quantitative score corresponds to the qualitative Management Rating. See the sections titled, *What Information Does the Pollinator Scorecard Provide?* and *Continuing the Journey*, for more information on how to apply these scores to future management.

Questions

Questions regarding the Management Module? Contact dan.salas@cardno.com or madalyn.lupinek@cardno.com.

Continuing the Journey

Congratulations on completing the Pollinator Scorecard! The habitat you provide supports the life cycle needs of pollinators and can help contribute to the efforts to create strong pollinator populations nationwide. The following steps highlighted below can help you continue the journey of supporting sustainable pollinator populations, drive momentum, and help you tell your story of success.

Practice Adaptive Management

The monitoring data collected via the Pollinator Scorecard will be instrumental in identifying potential issues with the habitat and guiding continuous improvements that will increase the value of the pollinator habitat to wildlife. Questions that can be helpful to answer when evaluating the results of the scorecard and other monitoring data are below:

- Is plant diversity being maintained or increasing?
- Is there a need to add plants (e.g., interseeding)?
- Are there blooms throughout the season?
- Are there non-compatible or invasive species that are impeding habitat goals onsite?
- Are management actions on some sites improving habitat conditions?

As you undertake management of pollinator habitat, the Rights-of-Way as Habitat Working Group encourages you to take your pollinator management to the next level. There are several other ways to engage partners, gain knowledge through monitoring and consulting current best management practices, share your success stories, and improve acknowledgement of your organization's efforts.

Participate in Citizen Science

To enhance the impact of monitoring efforts, consider contributing monitoring data to one or more citizen science projects. Each project may have a specialized monitoring protocol or may accept the data you collected for the Pollinator Scorecard as-is. The following citizen science programs are excellent ways to increase your impact and further scientific research on pollinators:

- The **Integrated Monarch Monitoring Program** is a national initiative to monitor monarchs *and* their habitats in a variety of land-use types, including rights-of-ways, to inform conservation. Milkweed density, nectar plant diversity, and monarch use data are collected by monitors from public and private resource agencies, biologists, and citizen scientists, and are compiled in a national dataset to learn about the monarch population and causes for its decline.
- The **Western Monarch Milkweed Mapper** uses volunteer uploaded photos of milkweed and monarch sightings to build a dataset in the western range of the monarch. Data will improve our understanding of the distribution and phenology of monarchs and milkweeds, identify important breeding areas, and help to better understand monarch conservation needs.
- Consider contributing to one of several large programs run by volunteer submissions of photos of insects, plants, and animals, such as **iNaturalist** and the **National Phenology Network**.
- **Monarch Tagging**: This program is run by Monarch Watch and gathers data on monarch butterfly population size and migration.
- **NABA Count Circles**: Join or start an official butterfly count sponsored by the **North American Butterfly Association** (NABA). NABA counts happen every mid-summer, and teams commit to

count within the same 15-mile diameter circle over time. Joining a count allows for interactions with other conservationists, while letting these concerned community members know about the current conservation program.

- **Project BudBurst**: This project is sponsored by the National Science Foundation and collects information on the timing of leafing, blooming, and fruiting phases of plants throughout the year. The data collected is used by scientists and educators to learn more about how plant species respond to changes in climate locally, regionally and nationally.
- The University of Illinois' **Bee Spotter citizen science program** collects data on bumble bee and European honeybee observations in Illinois.
- **Geospatial Habitat Database**: This database aims to collect data on pollinator habitat managed on rights-of-ways (ROW) and other landscapes across the United States. The database, once completed, will enable better quantification of habitat managed by ROW organizations, provide benchmarks for habitat restoration activities, highlight the ecosystem benefits that ROW provide, and promote new conservation partnerships and collaborations.

Apply for Certifications

Wildlife Habitat Council Conservation Certification®

WHC Conservation Certification sets the standard for corporate conservation actions, and produces quantitative benefits to corporations, communities and the environment. As the only voluntary sustainability standard designed to recognize corporate biodiversity efforts, Conservation Certification provides scorecard users with the opportunity to continue and expand their conservation actions while meeting their biodiversity, community and employee engagement and reporting goals.

Conservation Certification allows users to apply under any one of the 25 conservation themes, which are part of 4 conservation categories—Habitat, Species Management, Education & Awareness and Other Options. The program, which can consist of multiple projects, must meet 5 requirements in order to qualify for certification.

Projects related to pollinators can be submitted under the Pollinators theme in the Species Management category (as long as monarch butterflies and other pollinators are being monitored). If the project is designed to address a threat to monarchs, it can be submitted as a Species of Concern project as well. Since all projects must be associated with a habitat, both project themes can be linked to Integrated Vegetation Management (IVM), Grasslands, and Landscaping habitats. Scorecard users are encouraged to consult Project Guidances or contact WHC Strategy and Planning team for guidance when applying for Conservation Certification.

Right-of-Way Stewardship Council Accreditation

The Right-of-Way Stewardship Council (ROWSC) is an accreditation program that establishes standards for responsible right-of-way vegetation management along corridors. The program promotes the application of Integrated Vegetation Management (IVM) and best management practices to utility vegetation managers in order to maintain power system reliability and address ecological concerns.

The accreditation program has four phases to insure those in the program can demonstrate their commitment to IVM. The amount of time required for this process varies greatly dependent on size of the utility involved; size is dominantly dictated by miles of rights-of-ways managed. In general, a prospective utility should anticipate at least 90 days for the full process and 6 months for large utilities.

- Inquiry: The prospective utility completes a preliminary application (see resources Accreditation Application Form and Auditing Process Detail) and pays the application fee. The utility then participates in a conference call with the program administrator and audit committee chair to discuss process and to estimate costs. Prospective utility is now referred to as "Applicant."
- Statement of Work: A lead auditor is assigned and a statement of work (estimate of time, schedule, and cost) is developed after the gap analysis. Applicant participates in a conference call with lead auditor to do a gap analysis of Applicant's readiness and qualification for a full assessment. Applicant provides lead auditor with any pre-audit documentation requested (see resource Document Submittal Form). Based on statement of work the Applicant determines go/no-go or deferral of full assessment.
- On-site Assessment: The lead auditor forms an auditing team and coordinates with the Applicant to minimize time and cost while ensuring a comprehensive and objective evaluation of the Applicant's conformance with Right-of-Way Stewardship Council Accreditation Standards. The auditing team(s) will inspect both random and representative sites as well as Applicant documentation, equipment and interview staff. Applicant may provide on-site travel to reduce expense of the audit process.
- Report Development: The final report process has three phases: initial draft development by the auditing team, sharing and review by Administrator and Applicant with feedback, and Final Report and recommendations completed by the Lead Auditor. The auditing team's recommendations go to the full Right-of-Way Stewardship Council for final accreditation. The Council does not rule on the substance of the report but rather on the sufficiency of the process by the auditing team.

Monarch Waystation

A Monarch Waystation is a site that provides all of monarchs' habitat needs: milkweed plants for caterpillars, nectar sources for adult butterflies and shelter for the butterflies as they migrate through North America.

If the pollinator habitat includes all of these habitat needs, it could certify the site as a Monarch Waystation through Monarch Watch. Once requirements are met, an application would need to completed, which includes a nominal processing fee.

Following the application process, the team will receive a certificate displaying the organization's name and a unique Monarch Waystation identification number. Small, 9-inch by 12-inch weatherproof signs are also available for purchase and display from the Monarch Watch website. Once the site has been registered as a Monarch Waystation, the team may submit photographs of the site's unique habitat to be included in the online registry.

Monarch Conservation Agreement with Assurances

The Rights-of-Way as Habitat Working Group at the University of Illinois-Chicago is leading a national, multi-sector collaborative effort to develop a voluntary conservation agreement to provide habitat for the monarch butterfly. More than 40 organizations from across the energy and transportation sectors worked together to develop a Candidate Conservation Agreement with Assurances (CCAA) that encourages non-federal landowners and land managers to adopt measures to create net conservation benefits for the monarch butterfly. The effort is unprecedented in terms of its cross-sector participation

and geographic extent. The agreement is expected to span the entire contiguous 48 states and encompass millions of acres of habitat.

This Agreement will allow companies and organizations to perform certain covered activities, such as maintaining and modernizing existing infrastructure, and creating new habitat, on lands they own, lease, or manage. Participating in the Agreement demonstrates that organizations are providing a net benefit to monarch butterflies across the lands they manage by conserving habitat through actions like reduced mowing, targeted herbicide treatments, or revegetation with native plants. These actions across the geographic scope of energy and transportation lands will make a meaningful contribution to providing monarch habitat resources throughout the continental United States. In exchange for commitments made, the Agreement will give assurances that no additional regulatory requirements will be requested by the U.S. Fish and Wildlife Service beyond the terms in the Agreement. The Agreement will help companies and agencies avoid costly delays and last-minute disruptions to construction and maintenance activities associated with species listing requirements.

The Pollinator Scorecard, as it currently stands, can be used as a means of monitoring in agreement with the CCAA standards.

Share your Success

It is important to celebrate even the smallest win for pollinators and biodiversity. Every act of conservation matters. Share your successes and lessons learned with others to generate more and continuous interest in the pollinator conservation movement. Consider what you want your success story to be and share it internally, with community members, and with other stakeholders.