



Introduction:

About the Stewardship Index for Specialty Crops

SISC is a multi-stakeholder initiative to develop a system for measuring and communicating on farm sustainable performance throughout the specialty crop supply chain. The project is a collaboration among influential grower organizations, Non-Governmental Organizations (NGOs), and buyers of specialty crop products. SISC aims to establish a common suite of outcomes-based metrics that enable operators at any point along the supply chain to benchmark, compare, and communicate their own performance in meeting sustainability goals. An overview of the metrics is available at http://www.stewardshipindex.org/working_metrics.php.

About This Metric

This metric was developed to measure on farm habitat and biodiversity. Biodiversity is the variety and health of organisms at all levels, from microbes to mammals. Habitats are the environments that support these various organisms. Increased biodiversity and habitat is generally associated with greater ecosystem health, so growers can use this metric as a tool to track continual improvement of ecosystem health on their farm over time.

This metric documents and tracks the extent of on farm habitat and practices associated with positive biodiversity results.

The following two sections will outline the space and time boundaries on how to capture this information for your farm.

Total Farmed Area

SISC defines the Total Farmed Area (TFA) as an area owned or rented by the farming business that shares resources such as machinery, water, or staff. The TFA can be comprised of one or more Management Areas. For this metric, TFA includes creeks, riparian areas, buffer zones, wetlands, and non-built areas that are part of the farm but are not under cultivation as well as built areas like roads and buildings. Note that this is slightly different from the standard TFA definition used for other SISC metrics, and in fact does include roads, buildings, etc. because they are relevant to measuring habitat and biodiversity outcomes.

Operations in different states or regions should be reported as separate farms.

Mapping Tool

An online tool with aerial imagery is available at <http://tinyurl.com/siscmap> to help you to accurately and quickly measure the dimensions of your fields, patches of habitat, and other farm features. Step-by-step instructions are provided on the website.



Renters/lessees vs. landowners

Regardless of whether you own or lease the property you farm, please fill out the metric to the best of your knowledge; or identify the person on the farm who can most readily access the necessary information and ask them to provide it.

Reporting Timeframe

To facilitate consistent and comparable use of the SISC metrics, specific periods are prescribed for collecting the data needed for each metric. The section below describes the reporting intervals for each metric.

Reporting Year

The reporting year for a SISC-measured crop is the calendar year in which a crop is harvested, regardless of when the crop was planted or when the data are reported.

Example One: Crop A is harvested in October 2017 but the grower reports it to SISC or another party in 2018. The reporting year for this crop is 2017 because that is when it was harvested.

Example Two: Crop B is planted in November 2016 and harvested in April 2017. The reporting year for this crop is 2017 because that is when it was harvested.

Start and End Dates for Data Collection

The data collection interval varies among SISC metrics. The data collection interval for the Habitat and Biodiversity metric is annual. Please report data using calendar year.

Three-year Rolling Average

SISC recognizes that fluctuations in weather, pest pressure, climate, markets, and other variables will change metric results from year to year. To better reflect the on-going sustainability performance of an operation, it is recommended that SISC metrics be considered on a three-year rolling average for each metric. For perennials, this should be the last three reporting years.

Feedback

Your feedback can help SISC improve the utility and feasibility of this metric. Please document your experience using this metric and make suggestions for improvement using the form on Page 16 to or by email directly to info@stewardshipindex.org.



1. Farm Landscape Descriptions:

A. Describe **your farm** in terms of field size and distribution of natural vegetation by answering the following three questions. More complex landscape configuration including patches of natural habitat can have a strong positive influence on biodiversity.

Please circle one or two options for each question:

a. What size are your fields? A field is an area planted with the same crops throughout, or short term fallowed throughout, typically bordered by roads or non-crop vegetation, that is harvested in the same season.

Small (<1 ac) Medium (1-5 ac) Large (5-40ac) Very Large (>40ac) Variable size

b. What size are the patches of natural vegetation on your farm? A patch of natural vegetation is an area with natural or semi-natural vegetation that has not been cropped in >1 year, and may be embedded within a field but more typically would be located around or between fields or at the edge of the farm.

Small (<1 ac) Medium (1-5 ac) Large (5-40ac) Very Large (>40ac) Variable size

c. How many patches of natural habitat are there on your farm?

0 1-5 6-10 11-25 26-50 50-100 >100 patches

B.. Describe **the landscape/neighborhood around your farm** in similar terms of field size and distribution of natural vegetation.

Please circle one or two options for each question:

a. What size are the farm fields in the neighborhood around your farm?

Small (<1 ac) Medium (1-5 ac) Large (5-40ac) Very Large (>40ac) Variable N/A

b. What size are patches of natural vegetation in the area around your farm?

Small (<1 ac) Medium (1-5 ac) Large (5-40ac) Very Large (>40ac) Variable N/A

c. How many patches of natural habitat are there on other farms in your neighborhood?

None A Few Some Many N/A



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2. Data Collection

For clarification of terms, please read Glossary and Data Notes starting on page 8, then fill in the table. Include approximate acreages to the nearest acre in order to track your land use changes accurately over time. SISC's online mapping tool is <http://tinyurl.com/siscmap>.

Data Item	Description	2016 acres	2017 acres
1. Total Farm Area	<i>Total area for this site</i>		
2. Farm area cropped (annual and/or herbaceous)	<i>Total area with seasonal or annual cover or row crops, perennial herbaceous, or short-term (≤ 1 year) fallow to be replanted with annual/herbaceous crops</i>		
3. Farm area cropped (perennial)	<i>Total area with perennial, woody-stemmed crops</i>		
4. Farm area non-cropped	<i>Total area currently without crops, excluding built/developed areas, but including any natural vegetation, open water or managed non-crop vegetation. Would include land fallowed > 1 year. Should equal sum of forest, grassland, and open water.</i>		
5. Farm area built/developed	<i>Total area with buildings, roads, pavement, work yards, or other development</i>		
6. Natural Woodland/forest	<i>Total area with >30% canopy cover of non-crop trees</i>		
7. Natural Grassland/scrub	<i>Total area dominated by grassland or shrubs</i>		
8. Natural riparian	<i>Total area of vegetation dominated by grasses, shrubs, or trees adjacent to or within a seasonally or perennially flowing drainage</i>		
9. Open water/wetland	<i>Total area currently with seasonal or perennial open water or wetlands, including rivers, ponds, marshes</i>		



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Please fill in the following two checklists. See also Glossary and Data Notes starting on page 8, and <http://tinyurl.com/siscmap>. Circle or write in responses, as appropriate:

3. Practice-based indicators: Cropped areas

	Yes	No	N/A
1. More than one crop species on the farm at one time If yes, how many crop species? _____			
2. More than one variety of any of your crops If yes, for how many crop types do you grow >1 variety? _____			
3. Grain/cereal/seed/oil/rice crops with wildlife friendly management If yes, what management practices? (e.g., no chemical fertilizer, reduced weed control, leave stubble, leave portion unharvested, seasonal flooding) _____			
4. Alfalfa crop If yes, % of total crop area _____			
5. Hay or other feed crop? If yes, % of total crop area _____			
6. Hay or feed crop harvest timed to avoid nesting birds?			
7. Cover crops/green manure between crop cycles or within portion of cropped areas? If yes, % of total crop area _____			
8. Cover crops/green manure with wildlife friendly management (e.g., sow flowering crop type and allow cover crop to flower) If yes, what percentage of cropped area? _____			
9. Crop rotation If yes, rotation length. Specify months or years _____			
10. Intercropping or multistory cropping If yes, what percentage of cropped area? _____			
11. Disking only (no moldboard plowing) If yes, what percentage of cropped area? _____			
12. No tillage (e.g., mowing only under perennial crops) If yes, what percentage of cropped area? _____			
13. Other wildlife-friendly tillage (e.g., delay plowing to avoid nesting birds) If yes, what percentage of cropped areas? _____			
14. Organic material added to soil annually or more frequently If yes, what type? (e.g. compost, manure) _____			
15. Crop protection products (including herbicides): none			
16. Crop protection products: organic-certified only			
17. Crop protection techniques: reduce use to protect wildlife			
18. Crop protection techniques: GPS enabled precision spray			
19. Crop protection techniques: Biological control			
20. Other (please specify): _____			
21. Other (please specify): _____			
Totals:			



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4. Practice-based indicators: Non-cropped areas

	Yes	No	N/A
1. Conservation buffer If yes, acres or linear feet and average width _____			
2. Pollinator/beneficial insect habitat (e.g., insectary strips) If yes, acres or linear feet and average width _____			
3. Hedgerows up to 6ft tall and/or wide If yes, acres or linear feet and average width _____			
4. Hedgerows >6ft tall If yes, acres or linear feet and average width _____			
5. Bird or bat boxes, platforms, or perches? If yes, how many of each type? _____			
6. Conservation of native ecosystems (on land or aquatic)			
7. Conservation of habitat for species of concern (e.g., protected or sensitive species)			
8. Conservation of large blocks of habitat			
9. Water resource practices to minimize impact If yes, what management practices? Specify interval. (e.g., aquatic plants removed 1x yr, dredging every 3 yr) _____			
10. Water quality buffer around water bodies			
11. Improved buffer around water bodies and irrigation ditches If yes, how is vegetation managed? Specify interval (e.g., mowing, mowing once per year, bank vegetation pruned every 3 yr) _____			
12. Seasonal shallow water If yes, how is aquatic vegetation and dredging managed? (e.g., less frequent dredging/veg removal) _____			
13. Restoration of in-stream aquatic habitat If yes, what management practices? _____			
14. Conservation easement/agreement			
15. Invasive species management plan implemented			
16. Management of a portion of your farm to ensure wildlife can safely move through the landscape (i.e., wildlife connectivity) If yes, how? _____			
17. Other (please specify): _____			
18. Other (please specify): _____			
Totals:			



Area Calculations and Practices Score

Vegetated and Developed Areas Calculations. From Data Collection on Page 4.

% total farm area cropped (annual) = $\frac{\text{Farm area cropped (annual)}}{\text{Total farm area}} \times 100 =$ _____%

% total farm area cropped (perennial) = $\frac{\text{Farm area cropped (perennial)}}{\text{Total farm area}} \times 100 =$ _____%

% total farm area non-cropped = $\frac{\text{Farm area non-cropped}}{\text{Total farm area}} \times 100 =$ _____%

% total farm area built/developed = $\frac{\text{Farm area built/developed}}{\text{Total farm area}} \times 100 =$ _____%

Natural Habitat Calculations. From Data Collection on Page 4.

% natural upland forested vegetation = $\frac{\text{Woodland/Forest area}}{\text{Total farm area}} \times 100 =$ _____%

% natural upland grassland and/or scrub vegetation = $\frac{\text{Grassland and/or shrub area}}{\text{Total farm area}} \times 100 =$ _____%

% natural riparian vegetation = $\frac{\text{Riparian area}}{\text{Total farm area}} \times 100 =$ _____%

% open water/wetland = $\frac{\text{Open water/wetland}}{\text{Total farm area}} \times 100 =$ _____%

Management Practices Score– Cropped Areas- From page 5

Cropped Areas Score = # of applicable practices implemented (max. 21) = _____

Management Practices Score – Non-Cropped Areas—From page 6

Non-Cropped Areas Score = # of applicable practices implemented (max. 18) = _____



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Background:

The Habitat and Biodiversity metric was developed to indirectly measure biodiversity richness and infer its benefits for ecology on the farm. Increasing biodiversity and habitat is associated with higher ecosystem functioning and with the provision of ecosystem services, e.g., pollination, pest management, and soil nutrient cycling. This metric documents and tracks practices that reflect positive biodiversity outcomes - on farm practices that can either lead to, or diminish, on farm biodiversity. This metric relies on indirect indicators primarily because of the prohibitively time- and knowledge-intensive nature of direct biodiversity measurements (i.e., biological sampling and identification of species). Growers are the ones who will be filling out this metric, and we cannot ask very busy growers to monitor species and habitats. Therefore, proxy indicators are used, including on-farm conservation practices and measurements of the areal extents of natural and non-crop vegetation types.

Your answers to sections 1 of this metric provide a general description of the landscape characteristics on and around your farm. The information you provide in section 2 allows you to precisely calculate the acreage of vegetation and land cover types on your farm. These vegetation and land cover types correspond to standard, generalizable habitat categories that are also known to correlate with higher biodiversity. Sections 3 and 4 are checklists of practices for cropped and non-cropped areas, respectively; the total number of practices you implement is your "score" for this metric. These practices are known through scientific studies or expert assessment to support positive biodiversity outcomes.

The metric score is currently a simple calculation based on the number of practices applied across the farm. The checklist may evolve as new studies and literature syntheses are available and the score could be weighted accordingly. The acreages and write-in answers are primarily for informational purposes and do not currently contribute to the score, but could be integrated in future iterations of the metric. This metric, along with other SISC metrics, will continue to evolve over time and be updated in accordance with the SISC metric multi-stakeholder development process.

The SISC Habitat and Biodiversity metric is partially aligned with the Cool Farm Tool (CFT) Biodiversity Metric/Gaia Yardstick, which is, similar to SISC, a checklist of practices and farm characteristics. The CFT score, however, is weighted based on scientific studies with emphasis on Northern Europe. The SISC metric does not have a parallel weighting system. Weighting systems unique to global bioregion types will need to be developed prior to such weighting happening uniformly. Write-in answers in SISC Biodiversity metric sections 3 and 4 correspond to CFT-listed practices in order to align the two metrics in terms of data collected. However, space and formatting limitations in the SISC metric allowed only minimal modification of the checklist, and write-in responses are the most space efficient option.

The SISC Habitat and Biodiversity index is not explicitly region-specific, though some practices are defined similarly to NRCS practices and therefore may be more familiar to North American users. Focal taxonomic groups include native plants, mammals, birds, insects, and other terrestrial wildlife; and aquatic vertebrates and invertebrates. At this time soil invertebrate and microbial communities are not a direct focus, although they are known to play critical roles in the food web and provision of ecosystem services.



Glossary and Data Notes

The following notes apply to Page 4 Data Table and Practices Checklists above:

For the purposes of this metric, a farm is defined as a contiguous area that is owned or managed by the same entity for primarily agricultural purposes, including both cultivated and any uncultivated areas. A property that is split by roads or other landscape features may be counted as a single farm, as long as parts of the property are separated by no more than 100 feet.

Data Table – Vegetated and Developed Areas Calculations

Farm Area Cropped (annual): May include annual or biennial specialty crops (e.g., leafy greens, strawberries), or annual crops not covered by the Stewardship Index.

Farm area cropped (perennial): May include perennial specialty crops or perennial crops not covered by the Stewardship Index.

Farm area built/developed: Intended to identify all non-vegetated areas of the farm, including buildings, roads, paved areas, or other bare ground associated with the built environment.

Farm area non-cropped: Intended to identify non-cropped areas of the farm where natural habitat and/or native species are predominant. Includes fields fallowed longer than one year provided they are not regularly plowed or cleared of vegetation. A visual estimate of species is sufficient. Native plant species may be determined by reference to state or regional species list, such as those developed by state native plant societies or The Nature Conservancy's ecoregional plans. Alternatively, it may be assumed that vegetation cover consists predominantly of native species if it is not planted, cultivated and is not dominated by introduced or invasive species.

Data Table – Natural Habitat on non-cropped areas

Natural forested vegetation: Intended to include all non-cropped, non-built/developed areas of the farm where tree cover is 30% or greater. Understory may be open or dense.

Natural grassland and/or scrub vegetation: Intended to include all non-cropped, non-built/developed areas of the farm where grassland or shrubs predominate and are not seasonally or perennially inundated. Overstory may contain up to 30% cover trees or tree-like woody species.

Open water/wetland: Intended to include the wetted channel and banks of rivers, creeks, and ponds, as well as seasonally or perennially inundated areas (i.e., wetlands and marshes).



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The following notes apply to completing the tables above.

Management Score Answers: In the scoring tables, check “Yes” for practices currently implemented on-farm. Check “No” for practices that are not currently being implemented or maintained. Check “N/A” for practices that are not possible or appropriate to apply to this property. A blackened square in the N/A column indicates that the practice is universally implementable, and the Yes or No box should be checked. Gray cells are not checked. A practice need not be implemented on the entire farm to qualify but should be meaningful in relation to the size of the farm and biodiversity conservation opportunities. Producers interested in planning and implementing new practices are encouraged to consult with local offices and technical guides of the Natural Resources Conservation Service (NRCS), Conservation Districts, relevant state and local agencies, and local- or state-level conservation planning documents (such as the State Wildlife Action Plans or The Nature Conservancy’s ecoregional plans, where available).

Management Practices - Cropped Areas

1. More than one species of crop: Multiple species of crop are produced on a single farm concurrently. Agricultural crop diversity is a form of biological diversity, *per se*, and also can help improve crop resilience, prevent the spread of pests and diseases, and support native biological diversity by providing increased structural and temporal heterogeneity, nectar sources for pollinators, nesting, and/or foraging opportunities.
2. More than one variety of crops: Multiple varieties of one or more crop types/species are grown on a single farm concurrently or in succession. Benefits to agriculture and biodiversity are similar to the practice of growing more than one species described above insofar as genetic diversity and crop species diversity are considered biological diversity.
3. Grain/cereal/seed/oil/rice crops with wildlife friendly management: One or more of these crop types are grown on a portion of the farm either as animal feed or for human consumption, and some or all of the area where these crops are grown is managed to provide resources or habitat for wildlife. These crop types and management practices provide pollen, seed sources, foraging opportunities, shallow water, and other benefits to wildlife, particularly birds. Grasses and sunflower species can also provide pollen or nectar sources, respectively, for pollinators.
4. Alfalfa crop: Alfalfa or related perennial herbaceous crop type is grown on a portion of the farm, typically for animal feed. Alfalfa is a perennial herbaceous crop that can provide nesting, foraging, and other benefits to wildlife, particularly birds.
5. Hay or other annual feed crop: Hay or another annual feed crop type is grown on a portion of the farm. Unlike alfalfa, which is harvested but not replanted each year, these annual crops can provide seasonal nesting, foraging, and other benefits to wildlife, particularly birds.
6. Hay or feed crop harvest timed to avoid nesting birds: Hay or other annual feed crop harvest is timed to ensure breeding bird nesting is complete. This typically means delaying harvest.



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7. Cover crop/green manure: Cover cropping consists of growing a ground cover of grasses, small grains, legumes, or other herbaceous plants that is not harvested but is rather left in place for soil, water, or conservation benefits. For annual crop types, a cover crop is grown between harvested crop cycles and is generally terminated and incorporated in preparation for the following crop. For perennial crop types, a permanent cover crop may be established and left in place indefinitely below trees, canes, or vines. Ground cover provided by cover crops should generally reach at least 90% (10% or less of the ground area remains bare), but cover will vary according to season, crop, and region, and need not be measured to qualify.

8. Cover crop with wildlife friendly management: Cover cropping that includes practices to enhance wildlife use such as delayed tilling to provide flower or seed resources.

9. Crop rotation: Crop rotation consists of growing two or more crops in a planned, recurring sequence on the same field. Forage or other non-specialty crops may be included in the rotation. Agricultural crop diversity can help improve crop resilience, soil health, prevent the spread of pests and diseases, and can support biological diversity by providing increased heterogeneity.

10. Intercropping or multistory cropping: Intercropping is the practice of growing two or more crops (including cover crops) in close proximity and during the same growing season. Multistory cropping is an intercropping system that includes an overstory of trees or shrubs and an understory of crop plants. Growing two crops in adjacent fields would not qualify for this practice, but growing two crops in strips in a single area would. Other examples might include growing perennial tree or cane crops with a crop or forage understory; planting a later second crop into a standing first crop ("relay planting"); alternating rows of a tall crop with a shorter crop; or planting small areas of different crops within a single field of a diversified operation. This is an agricultural diversification practice that can help improve crop resilience, soil health, prevent the spread of pests and diseases, and can support biological diversity by providing increased heterogeneity.

11. Disking only: This conservation tillage practice can maintain or improve soil health while reducing ground disturbance, and can reduce runoff and impacts to aquatic biodiversity, and invertebrate and vertebrate belowground biodiversity.

12. No tillage: This conservation tillage practice permits some aboveground disturbance through, e.g., mowing, but can maintain or improve soil health while reducing ground disturbance, and can reduce runoff and impacts to aquatic biodiversity, and invertebrate and vertebrate belowground biodiversity.

13. Other wildlife-friendly tillage: Practices such as delayed tillage to avoid nesting birds can reduce impacts of tillage to biodiversity. If Practice 7 box was checked for delayed tillage on cover crops, do not check this box in addition unless additional practices are being used.



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14. Organic material added to soil annually or more frequently: Compost and manure can improve multiple aspects of soil health and diversity of belowground biodiversity, and reduce use of synthetic fertilizers, which can impact aquatic biodiversity. Heat-treated organic material has been demonstrated to be compatible with food safety in produce.

15. Crop protection products: none: Not applying crop protection products can improve diversity and populations of aquatic and terrestrial invertebrate communities and reduce bioaccumulation of persistent chemicals in vertebrate aquatic and terrestrial communities.

16. Crop protection products: organic-certified only: Using only organic-certified crop protection products can improve diversity and populations of aquatic and terrestrial invertebrate communities and reduce bioaccumulation of persistent chemicals in vertebrate aquatic and terrestrial communities.

17. Crop protection techniques: reduce use to protect wildlife: Intentional reduction in the amount of active product or reduced frequency of use of chemical crop protection products can reduce impacts to aquatic and terrestrial wildlife.

18. Crop protection techniques: GPS enabled precision spray: Targeted spraying is one approach to reducing drift and has been shown to reduce excess chemical entering natural areas including aquatic and terrestrial habitats.

19. Crop protection techniques: Biological control: Release or other use of active biological agents in lieu of chemical control has been shown to reduce impacts to aquatic and terrestrial habitat and populations.

Management Practices - Non-Cropped Areas

1. Conservation buffer: Conservation buffers are areas or strips of land in permanent or annual vegetation that are designed to intercept pollutants and conserve ecosystem services. Minimum width must be 10 feet for inclusion in this metric. This may include riparian buffers, filter strips, grassed waterways, shelterbelts, windbreaks, living snow fences, contour grass strips, cross-wind trap strips, field borders, herbaceous wind barriers, and vegetative barriers. More information on planning and implementing buffers is available at:

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/home/?cid=nrcs143_023568. Buffers can increase overall habitat area and wildlife access to food, cover, and water, protect sensitive habitats from negative impacts, restore connectivity between terrestrial habitats, and provide shade to maintain cooler stream temperatures.

2. Pollinator/beneficial insect habitat: Habitat for beneficial insects may be established in small or large areas, including field borders but not hedgerows (covered below). Actions may include protecting existing flowering vegetation and nest sites from disturbance by cultivation or spraying; establishing locally-appropriate flowering plants on field margins; growing strips of vegetation around cropped fields to provide habitat for insect predators of common pest species ("beetle banking"), and creating bee nests by leaving some ground untilled and unsprayed or providing "bee boxes." For producers interested in planning and implementing pollinator-friendly



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practices, more information is available from NRCS at

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/>.

3. Hedgerows up to 6 ft wide or tall: Small hedgerows can support pollination, resting, and foraging.

4. Hedgerows > 6 ft wide or tall: Larger hedgerows have additional benefits including bird nesting opportunities.

5. Bird or bat boxes, platforms, or perches: Provide direct benefit to these species.

6. Conservation of native ecosystems: This practice includes the establishment, maintenance, or enhancement of areas of diverse, native vegetation appropriate to the site, such as grassland, forest, or wetland ecosystems (natural areas). For example, a wetland may be left undrained and undeveloped; an area being withdrawn from crop production may be planted in a diverse mix of native grass and forb species to create a grassland ecosystem; or invasive weeds might be removed from an existing woodland and native understory plants established in their place. Qualifying areas should not be cropped, grazed, or otherwise disturbed, unless the ecosystem is dependent on prescriptive grazing, fire, or other disturbances to maintain native vegetation. Nonnative species should be controlled whenever possible. Creating and managing a native ecosystem is a long-term process, and the results of these efforts may not be immediately visible on the landscape; however, evidence of ecosystem restoration even where mature plant communities are not yet established may be counted. Producers considering establishing new natural areas or making changes to existing ones are encouraged to consult with local experts and local or state conservation plans to identify the species and other elements that are most appropriate for a given site.

7. Conservation of habitat for species of concern: Additional credit is given for activities described under practice (conservation of native ecosystems), where the ecosystems being established, maintained, or enhanced provide habitat for federal- or state-listed threatened or endangered species or other species listed at the state or federal level as being of special conservation concern. Producers considering establishing new habitat or making changes to existing habitat for listed species should be aware of state and federal laws regarding potential impacts on the species from project implementation and future maintenance and should consult with the appropriate state and federal agencies before beginning a new project.

8. Conservation of large blocks of habitat: Additional credit is given for activities described under practice 6 (conservation of native ecosystems), where the ecosystems being established, maintained, or enhanced form large, contiguous areas of diverse, native vegetation. Areas must be at least 20 acres or at least half the total land area of the farm, whichever is smaller. Smaller on-farm natural areas also qualify if they are contiguous with off-farm natural areas, for a total patch size in native vegetation of at least 20 acres.

9. Water resource protection/practices to minimize impact to wildlife: There is no apparent evidence of contamination of on-farm water resources, and streams and other waterways appear free of pollutants, such as garbage, pesticides, oil, fertilizer, or manure. There is no



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evidence of pollutants being dumped into waterways. Septic systems are located away from wetlands and other surface waters. Sediment and aquatic plant management practices, including less frequent dredging or sediment removal, may benefit biodiversity. Further information available at <http://www.conservationevidence.com/actions/135>.

10. Water quality buffer: A buffer area of permanent, non-crop ground cover vegetation is established around on-farm water resources to protect water quality and aquatic ecosystems. Different from Practice 1 (Conservation Buffers) in that they surround water rather than upland or cropped areas. The width of the buffer should be at least 35 feet from the high water mark, unless a greater or lesser value is designated in guidance from a local NRCS field office or a greater value is required by local or state law. While the width of buffer needed to protect water quality will vary according to local conditions and buffer type, this width reflects current NRCS national guidelines and is intended to be a best estimate of the appropriate width for buffers designed specifically to protect surface waters from contamination. Field office technical guides are available at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>.

11. Improved water quality buffer: Additional credit is given for buffer areas around water resources that are of greater value to biodiversity because of increased width, use of native species, species diversity, or other enhancements. For example, wider buffers are more likely to provide habitat or travel corridors for a greater diversity of wildlife species. A buffer that includes diverse native species provides greater benefits to native biodiversity, and a buffer with a mixture of vegetation that includes trees and shrubs (where appropriate) can help shade waterways and improve aquatic habitat for cold water dependent species. Producers considering establishing or improving new buffer areas are encouraged to consult with local experts and local or state conservation plans to identify the species and other elements that are most appropriate for a given site. As described for Practice 9, less frequent disturbance can benefit biodiversity. Further information available <http://www.conservationevidence.com/actions/135>.

12. Seasonal shallow water: Includes creating, protecting, or improving seasonal shallow water (1-18" depth) habitat for native species. Existing shallow-water habitat may be simply left in place. Only certain kinds of sites, soils, and water sources are appropriate for the establishment of seasonal shallow water habitat, and producers considering implementation of this practice should consult with an NRCS field office or other habitat restoration expert. Similar to Practices 9 and 11, which apply to irrigation ditches and water quality buffers rather than natural or semi-natural ponded areas, less frequent disturbance may benefit biodiversity.

13. Restoration of in-stream aquatic habitat: This practice addresses in-stream projects to improve habitat conditions for native aquatic species or to restore ecological processes such as natural flow regime, meander migration, sediment transport, retention of large woody debris, and floodplain interactions with the stream. Producers considering in-stream restoration work should plan activities around site-specific conditions, such as local hydrology, native species, water quantity and quality, and floodplain conditions; should be aware of relevant local, state, and federal regulations; and should consult with local experts, including appropriate local, state,



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and federal agencies. Credited activities should not impede fish passage, cause excessive bank erosion, degrade the stream channel, or hinder channel-floodplain interactions.

14. Protected by conservation easement or long-term management agreement: Additional credit is given for conservation areas where ecosystem values are protected by a conservation easement or other voluntary long-term (>30 year) management agreement.

15. Invasive Species Management Plan: The development and implementation of an invasive species management plan. This plan should address strategies for the prevention or avoidance, monitoring, and treatment of outbreaks of invasive plant or animal species. It should identify invasive species that have been identified on the farm site and describe new or ongoing efforts to control those species. More information on invasive species is available from NRCS; a leaflet on managing invasive species in fish and wildlife habitat is available at <http://www.whmi.nrcs.usda.gov/technical/leaflet.htm>.

16. Wildlife connectivity. Infrastructure design and layout (e.g., fences, buildings, lighting, irrigation), crop or field layout, and/or vegetation or water management intended to provide safe passage for native, non-domestic animals moving through the farm landscape. Permeable farm landscapes provide important wildlife movement pathways to connect nodes of core habitat for many wide-ranging species such as deer, bobcat, and certain types of amphibians.



Feedback

For SISC to improve this metric over time, it is valuable to get your feedback on the process you went through to collect data for the metric, and to get your overall impression of the metric itself. If you prefer, you may send feedback directly to info@stewardshipindex.org.

1. How many hours would you estimate you spent gathering the data for this metric?

2. Did you incur any expenses in gathering data other than man hours? If so, how much and what for? _____

3. How difficult was it to gather the required data?

___ Data was readily available in electronic format (spreadsheets, other systems)

___ Data was readily available in paper-based format (printed reports, utility bills)

___ Data was not readily available and I had to search for it

___ I do not currently collect this data at the field level and had to estimate

4. Which data was the most difficult to gather and why?

5. What is your overall impression of the metric and how it can benefit your operations?

6. What suggestions do you have for improving this metric?

