Guidance for remotely selecting Appalachian Grizzled Skipper (AGS) colony survey locations

The purpose of this document is to harmonize methods for remotely selecting AGS colony survey locations among the 12 federal and state partner agencies. This document provides guidance for completing the Appalachian Grizzled Skipper (AGS) Remote Site Selection Data Sheet

- Please use new Data Sheet for each site.
- On top of each page, please fill in basic information on date and site in the following order Date/State/County/Site #.

1. Site selector information: contact information of individual(s) selecting sites.

2. Site considered because: Site categories:
   a. Active colony - AGS observed since 2000.
   b. Previously Active - AGS last observed 1990-1999.
   c. Historically Active - AGS last observed 1989 and earlier.

   For colonies with known locations.

   d. Remote - No known AGS observations but habitat appears suitable for AGS.

   For remotely selected locations based on criteria presented here.

Methods:

a. Remotely locate Active, Past Active and Historically Active AGS colony locations.
b. Delineate a 20 km radius circle around each colony.
c. If data is available, use indicator plant species and natural communities associated with AGS to refine locations for potential habitat.
d. Within the 20 km circle, buffer the areas of interest (known AGS locations and locations with indicator plants) by 3 km radius.
e. Using recent, high resolution aerial imagery, search for potential AGS habitat within the 3 km radius circles that meet all three of the following criteria:
    a. Southeast to southwest aspect
    b. Open habitat.
        i. For the AGS Appalachian population, this includes clearcuts, unforested right of ways, open roadsides, or shale woodlands.
        ii. For the AGS Michigan population, this includes clearcuts, unforested right of ways, open roadsides, limestone openings or glades, alvars, sandy habitat (trap rock), oak-pine barrens, and pine barrens.
    c. Proximity to al least some trees (within 50 meters) for shade, resting sites, and protection.
f. Do not include areas that (1) have a full canopy of trees or shrubs, (2) are in agriculture (row crops, hayfield, or pasture), although tree farms may be included, (3) are mowed or developed. If aerial photography allows, exclude areas with denser vegetation.
g. Above process will leave areas with sparse vegetation and thin soils, i.e. possible locations of AGS colonies.

3. Tools used during remote selection: Please add details of tools used.

4. Site information: Provide site identification. This information should be the same as that entered on top of page.

5. Notes on site information: Provide additional notes on the methods used for site selected.

Appalachian Grizzled Skipper (AGS) Remote Site Selection Data Sheet

Date/State/County/ Site #_____

-Please use new form for each site.
-For assistance with this form, refer to the Guidance for remotely selecting Appalachian Grizzled Skipper (AGS) colony locations.

1. Site selector(s) information:
   Selector Name and Affiliation:_____
   Email:_____ Phone: _____
   Names and contact information of others involved in selection process: _____
   _____
   _____
2. Site considered because: Active Previously Active Historically Active Other
   For the Active, Previously Active and Historically Active, enter date of last observation record: _____
   Confidence in observation record: _____
3. Tools used during remote selection and source:
   a. Aerial imagery: _____
   b. Topographical maps: _____
   c. Soil maps: _____
   d. Historical records of AGS: _____
   e. Information on management actions (e.g., clear cuts, pesticide applications):
      _____
4. Selected site information:
   Site ID: _____ State: ____ County:_____
   Town:_____
   GPS coordinates: _____
5. Notes on site selection method:

Guidance for Appalachian Grizzled Skipper (AGS) Field Survey Data Sheet.

The purpose of this document is to harmonize methods for AGS surveys among 12 federal and state partner agencies. This document provides guidance for completing the Appalachian Grizzled Skipper (AGS) Field Survey Data Sheet.

- Please use new Data Sheet for each survey by site and date.
- On top of each page, please fill in basic information on date and site in the following order Date/State/County/Site #.
- Please take photos on smart phone with GPS points to map the site, characterize the habitat and to describe the host and nectar plant presence and distribution.

1. Observer information: contact information.

2. Location information: Site location.

3. Site selected because: Why this site was selected for survey
    a. Active colony - AGS observed since 2000.
    b. Previously Active - AGS last observed 1990-1999.
    c. Historically Active - AGS last observed 1989 and earlier.
    d. Remote selection - No known observations but habitat is suitable for AGS.

4. Survey conditions: Weather
    a. Temperature: Please specify Fahrenheit or Celsius. In comments section, add changes in temperature, wind speed and direction, cloud cover during the survey
    b. Wind: Velocity and direction.
    c. Cloud cover: Visually estimate percent cloud cover.
    d. Comments: Please include significant changes in weather during the survey.

5. AGS Survey: Scan the area to determine where the walk-through survey path will be placed. The recorder is not constrained by transects. Recorder should establish the survey path such that the entire site can be searched. The path should pass close to all areas with host and nectar plants. Do not record the same AGS individuals when doubling back on the path. Do not step on host and nectar plants.
    Note: The data sheet requests GPS point numbers. For each GPS point taken, you will assign it a unique identifier. For simplicity, record the unique GPS point identifier instead of entering the GPS coordinates.
    a. Walk-through survey: Once the path is determined, begin walk-through and enter the start time and start GPS point number.
    b. Continue recording GPS point numbers during the walk-through to delineate the survey path. A linear path (e.g., along a road) may require fewer GPS points than a winding path (e.g., through a meadow).
    c. Are AGS present? Circle Yes or No.
    d. GPS point numbers for AGS and confidence level:

i. Take GPS locations for the spot on the path that is closest to where the AGS was found.
ii. Enter the GPS point numbers in table.
iii. Enter level of identification confidence (Confident or Uncertain) in table.
iv. If confident, specify method used to establish confidence:
    1. Sight: diagnostic features were observed by sight without handling.
    2. Net: diagnostic features were observed on captured individuals.
    3. Photo: diagnostic features were observed by photograph
v. Uncertain: none of the above methods provided a confident identification.

e. AGS behavior: Circle the behaviors observed. If more than one AGS, circle more than one behavior.
f. Enter walk-through survey end time: and enter the GPS point number at end of survey path.
g. AGS count: Total number of AGS found during this survey.

6. Other butterfly species present: List other species observed at site.

7. Site habitat: Every site is different therefore, the best way to characterize the habitat at each site is through description. Examples of possible responses are included below:
    a. General description of site (ex. clear cut, service road, natural clearing, powerline, etc.).
    b. Host plant name and description of its distribution (ex. cinquefoil [Genus species] occurring in sunnier areas throughout the path but patchy distribution. Host plant flowering. No large or dense flowering mats. See photos…).
    c. Nectar plant species in bloom and description of their distribution. (ex. AGS seen on or near Bird's foot violet [Genus species] and phlox [Genus species]. Other possible nectar plants in bloom: dandelion [Genus species], vetch [Genus species], pussytoes [Genus species], flowering dogwood [Genus species], sassafras [Genus species]. Nectar plants found throughout the path but patchy distribution. Large clumps and dense of phlox and violets in some areas. See photos…).
    d. Map of survey path. (ex. AGS habitat within 20 feet along forestry road. Map provided. See photos…).
    e. Threats to area:
        i. Vehicular: vehicular activity is not contained to roads or tracks and is impacting the habitat patch.
        ii. Human: human activity is not constrained to trails, campsites, or other designated areas and is impacting the habitat patch.
        iii. Chemical: chemicals, including herbicides and/or pesticides, are evident nearby.
        iv. Succession: vegetation is encroaching on host plants and/or shading the patch.
        v. Invasive Species: invasive species are present on the site and the patch is susceptible to colonization.
        Development: roads, parking lots, buildings or other development is impacting the patch.

vi. Browse: deer and/or other herbivores are targeting host plants in the patch.
vii. Mowing: the patch has been mowed during the flight period of the frosted elfin or during the growing season of the host plant.
viii. Forestry: forestry equipment, logs, and or slash are present in the patch during the flight period of the frosted elfin or during the growing season of the host plant.
ix. Burning: fire has been present in the patch during the flight period of the frosted elfin or during the growing season of the host plant.
x. Grazing: cattle or other grazers are impacting the patch by trampling or incidentally eating the host plant.
xi. Other.
(ex. Vehicular - plants and AGS along edge of road may be squashed under truck tires. Succession - pine saplings encroaching and shading habitat. Invasive Species - multiflora rose encroaching and shading habitat. Forestry - surrounding area logged for wildlife management. Other- Dust from large trucks settling on flowers and AGS may interfere with foraging.)

f. Other comments: (ex. Possible reasons for why count for lower than expected. Not many flowering host plants and not many AGS so don't know if the survey was too early or too late in the flight period. Unseasonably cold weather during the previous week could have also affected AGS numbers).

Figure 1. AGS

Photographs by Ted Wilcox. Reproduced here with permission from Ted Wilcox on September 12, 2025. Dorsal and ventral views *Pyrgus centaureae wyandot* (Appalachian Grizzled Skipper [AGS]) in North Carolina.

Appalachian Grizzled Skipper (AGS) Field Survey Data Sheet

Date/State/County/ Site #_____

-Please use new form for each survey site and date.

-Please take photos on smart phone with GPS points to map the site, characterize the habitat and to describe the host and nectar plant presence and distribution.

-For assistance with this form, refer to the Appalachian Grizzled Skipper (AGS) Field Survey Guidance.

6. Observer(s) information:
   Observer Name and Affiliation: _____
   Email: _____ Phone: _____
   Names and contact information of others present: _____
   _____
7. Location information:
   Site: _____ State: ____
   County:_____ Town:_____ Site owner's name:
   _____
8. Site selected because: Active Previously Active Historically Active Remote selection
9. Survey Conditions: Weather:
   Temperature:_____ Wind:_____ Cloud cover:_____
   Comments:
   _____
10. AGS Survey:
    a. Walk-through survey: Start time: _____. Start GPS point number: _____.
    b. GPS point numbers along path:
       _____
    c. AGS present: Yes No.
    d. GPS point numbers for AGS and confidence level: Confident or Uncertain.

GPS number	Confidence and method	GPS number	Confidence and method	GPS number	Confidence and method	GPS number	Confidence and method

    e. AGS behavior: Patrolling/Perching, Feeding, Puddling, Basking, Mating, Ovipositing, Other_____
    f. Walk-through survey: End time: _____. End GPS point number: _____.
    g. AGS count: _____.
11. Other butterfly species present:
    _____
    _____
    _____

12. Site habitat: In your description on next page, please consider:
    a. General description of site.
    b. Host plant name and description of its distribution.
    c. Nectar plant species in bloom and description of their distribution.
    d. Map of survey path.
    e. Threats to area.
    f. Other comments.

    Site habitat description and additional notes. Continue on back if needed.