

Georgia Granite Outcrop Plants Effects Determination Guidance for Endangered & Threatened Species (EDGES)

Central Georgia Counties

Species Covered by this EDGES:

- Endangered: Black-spored quillwort (*Isoetes melanospora*) and mat-forming quillwort (*Isoetes tegetiformans*)
- Threatened: Little amphianthus (*Amphianthus pusillus*)

These three plant species grow in shallow, ephemeral pools on granite outcrops. Granite outcrops are found in the Piedmont region of Alabama, Georgia, and South Carolina. The pools have sandy, low nutrient soils and hold water for periods in the winter and spring. Little amphianthus grows, blooms, and sets seeds during this short period when the pools hold water. This is the most common of the three species, occurring on many of the outcrops throughout the state.



The two quillwort species tend to occur in pools that are deeper and hold water for longer periods. Mat-forming quillworts are known from the eastern portion of the state on outcrops with an underlying porphyritic granite geology. Black-spored quillwort occurs in the central and western portion of the state on outcrops with an underlying granitic gneiss or non-porphyritic geology.

Threats to granite outcrops include quarrying/mining, litter/trash dumping, development, off-road vehicle use, other recreational activities that destroy pools, eutrophication from excess nutrients (cattle and other grazing), invasive species (plants competing for habitat, insects disrupting seed or spore dispersal), encroachment from woody plants, increased use of outcrops for film and other industry, solar development, and vandalism.

This EDGES covers any project that will impact a granite outcrop in Georgia.

Endangered Species Act Consultation Checklist:

Applicant:

1. IPaC indicates granite outcrop plants may occur in the project area.
 - a. No.....No effect. Provide IPaC information to the Savannah District with application/PCN.
 - b. Yes.....Go to #2.
2. The Fish and Wildlife Service's Georgia Ecological Services Field Office (GA ES) in Athens already reviewed and provided comments on the project.
 - a. No.....Provide completed EDGES Applicant Consultation Form and supporting documentation to the Savannah District with 404 application/PCN.
 - b. Yes.....Provide GAES project review documentation and/or survey data to the Savannah District with application/PCN.
3. Were Determination key(s) completed in IPaC and a consistency letter auto-generated for the project.
 - a. No..... Provide completed EDGES Applicant Consultation Form and supporting documentation to the Savannah District with 404 application/PCN.
 - b. Yes.....Provide IPaC determination key and consistency letter to the Savannah District with application/PCN.

Savannah District:

4. Does IPaC indicate any one of the federally listed granite outcrop plants may occur in the project area.
 - a. No..... No effect.
 - b. Yes.....Go to #5.

5. Has GA ES reviewed the project and provided information that federally listed granite outcrop plants will not be impacted by the project or has the Savannah district determined that the project will have 'no effect' on these species.
 - a. No..... Go to #6.
 - b. Yes.....No effect.

6. Has the applicant provided a consistency letter from IPaC indicating the project will have 'no effect' on federally listed granite outcrop species or is 'not likely to adversely affect' these listed species.
 - a. No..... Go to #7.
 - b. Yes.....Verify that the applicant has completed the IPaC determination key properly. No concurrence from GA ES is required. Section 7 consultation complete.

7. Has the Savannah district completed the required determination key in IPaC and generated a concurrence letter.
 - a. No..... Go to #8.
 - b. Yes..... No concurrence from GA ES required. Section 7 consultation complete.

8. Is the project's potential area of effect within 0.25 mi of a known occupied outcrop (request technical assistance from Georgia DNR or U.S. Fish and Wildlife Service. The response is auto-populated in IPAC determination key).
 - c. No..... Go to #9.
 - a. Yes..... May affect. Please upload project documentation into IPaC and consult with GAES.

9. Is granite outcrop habitat appropriate for little amphianthus, black-spored quillwort, and/or mat-forming quillwort visible on aerial imagery or identified within the project's potential area of effect?
 - a. No..... No effect. No additional coordination with GA ES is necessary.
 - b. Yes..... Go to #10.

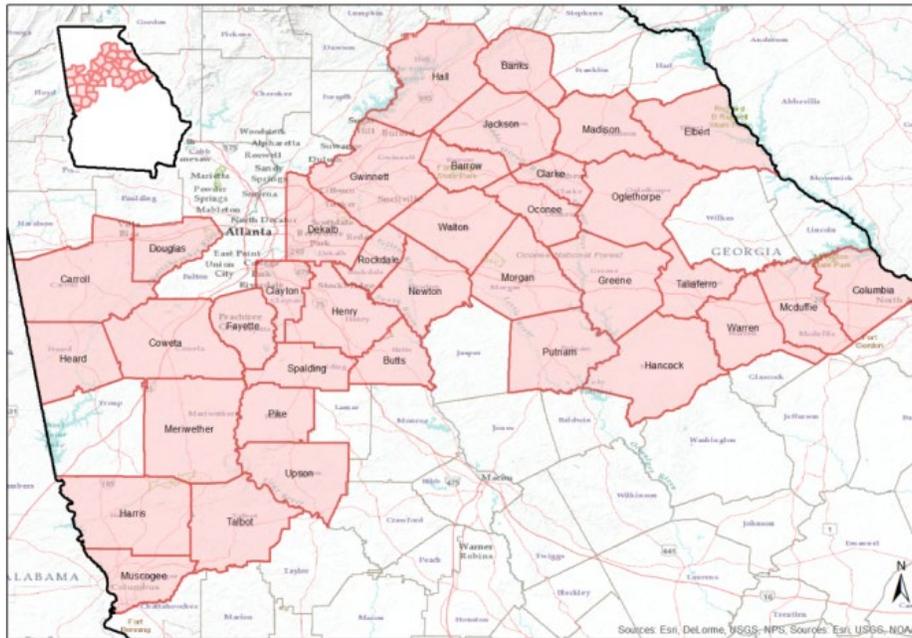
10. Were surveys were conducted by a qualified botanist when listed plants can be correctly identified.²
 - a. No.....Contact GA ES to determine if consultation is needed.
 - b. Yes.....Go to #11. Upload the survey report to IPAC.

11. Did surveys document pools occupied by little amphianthus, black spored quillwort, and/or mat forming quillwort on the outcrop?
 - a. No..... NLAA. Consultation complete. Please upload project documentation into IPaC.
 - b. Yes..... Go to #12.

9. Are appropriate avoidance and minimization measures included with the project that will avoid all impacts to listed plant species?³
 - a. No.....May affect. Please upload project documentation into IPaC and consult with GA ES.
 - b. Yes.....NLAA. Consultation complete. Please upload project documentation into IPaC.

Information to be Provided to the Savannah District for Endangered Species Act Review

- Copy of any survey documentation.
- Maps including location of project activities.
- Photos of the granite outcrop, including pools where listed plants might occur.
- Documentation detailing any construction activity resulting in the change of the granite outcrop's hydrology, reduced sun exposure, increase in invasive species, increase in sedimentation, or increase in contamination.
- Plans for post-construction re-vegetation and maintenance of disturbed habitats adjacent to or within granite outcrops. Plans should focus on use of native, non-invasive species that minimize seed dispersal and encroachment on granite outcrop habitats.
- Documentation for any avoidance and minimization related to project activities.



¹ Granite Outcrop Survey Period:

Appropriate survey time in Georgia for little amphianthus during flowering (March–April) and fruiting (April–May) and the appropriate survey time for black spored and mat forming quillwort is throughout the winter and spring and also following rainy periods in the summer. Higher temperatures in early spring or dry periods can cause the appropriate survey period to be slightly different than the above description. These species may not be visible after prolonged periods of dry conditions.

² Granite Outcrop Habitat:

The pools with federally listed species have sandy, low nutrient soils and hold water for periods in the winter and spring. Occupied habitat tends to have abundant light exposure and limited canopy cover and organic inputs to occupied pools. These pools can be completely dry during much of the summer and fall. Little amphianthus grows, blooms, and sets seeds during this short period when the pools hold water. This is the most common of the three species, occurring on many of the outcrops throughout the state.

The two quillwort species tend to occur in pools that are deeper and hold water for longer periods. Mat-forming quillworts are known from the eastern portion of the state on outcrops with an underlying porphyritic granite geology. Black-spored quillwort occurs in the central and western portion of the state on outcrops with an underlying granitic gneiss or non-porphyrritic geology.

Additional information can be found: https://georgiabiodiversity.a2hosted.com/natels/element_lists?group=plant

Black spored quillwort: <https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=6315>

Mat forming quillwort: <https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=887>

Little amphianthus: <https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=6445>

³ **Avoidance and Minimization for Granite Outcrop Species:**

- Equipment staging areas and equipment maintenance areas (particularly for oil changes) shall be located at least 200 feet from or any area draining into occupied granite outcrop habitat to minimize the potential for wash water, petroleum products, or other contaminants from construction equipment contaminating occupied pools.
- Pesticides and herbicides shall not be used within 200 feet of occupied granite outcrop habitat. Within 200 feet of the occupied granite outcrops, fertilizer shall only be used while grassing graded areas to achieve site stabilization.
- Excavation spoil and stockpiled materials shall be placed at least 200 feet away from or any area draining into occupied granite outcrop habitat to minimize the potential for rain runoff and additional organic inputs to pool habitat.
- Use orange barrier fence or other measure to protect granite outcrop habitats during construction activities.
- Vegetation removal, mowing and management of plants using mechanical devices for locations within known populations of federally listed plants should be coordinated with Georgia Ecological Services and Georgia Department of Natural Resources. Each Environmentally Sensitive Area shall have a management plan for all activities within the designated area.
- Any restoration, seeding, or replanting within habitats identified will be coordinated with Georgia Ecological Services and Georgia Department of Natural Resources or be in accordance with an approved management plan for the area or species. These activities will use only native seed mixes or plantings that are compatible with the focal species or habitats within the project area.
- Ensure all materials used in project design or construction are free from invasive plants before placement on site.
- All vehicles, machinery, and equipment are clean and free from invasive species before use at a project site.
- All vehicles, machinery, and equipment should be clean and free from plant or animal materials before being transported to a new project site, unless this movement is related to moving fill or other materials to an appropriate offsite disposal location.
- All vehicles, machinery, and equipment shall not use granite outcrop or exposed rock habitat for storage, parking, turnarounds, or other purposes unless explicitly needed and approved through coordination with Georgia Ecological Services Field Office.