ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Plant Abstract **Element Code:** PPASP02110
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Asplenium platyneuron*
COMMON NAME: Ebony Spleenwort
SYNONYMS: *Chamaefilix platyneuros, Acrostichum platyneuron, Asplenium ebeneum*
FAMILY: Aspleniaceae

AUTHOR, PLACE OF PUBLICATION: Britton, Nathaniel Lord, Emerson Ellick Sterns and Justus Ferdinand Poggenburg [BSP]. Ferns of North America 1:24. 1878.

TYPE LOCALITY:

TYPE SPECIMEN: Natural History Museum, BM 62962 (lectotype of *Acrostichum platyneuron*). John Clayton, #14. No date.

TAXONOMIC UNIQUENESS: *Asplenium* is a large genus with about 650 species distributed throughout the world, but mostly in the tropics and subtropics. NatureServe (2016) lists some 48 species in the U.S. and Canada, with another 17 varieties and subspecies, and at least 16 named hybrids. Nine species and one variety are found in Arizona. Two of these species, *A. exiguum* and *A. dalhousiae* occur only within the State. *A. platyneuron* finds its southwestern most range extension in Arizona.

DESCRIPTION: Roots not proliferous. Stems short-creeping, unbranched; scales dark brown to black throughout, narrowly linear-deltate, 2--4 × 0.3--0.6 mm, margins entire. Leaves ± dimorphic; fertile leaves taller and more erect than sterile leaves. Petiole reddish brown throughout, lustrous, 1--10 cm, 1/4--1/3 length of blade; indument of dark brown to black, filiform scales at base. Blade lustrous, linear to narrowly oblanceolate, 1-pinnate throughout, 4--50 × 2--5(--7) cm, thin, glabrous, or occasionally sparsely pubescent; base gradually tapered; apex acute, not rooting. Rachis reddish or purplish brown throughout, lustrous, glabrous. Pinnae in 15--45 pairs, oblong to quadrangular; medial pinnae 1--2.5 × 0.3--0.5 cm; base with conspicuous acroscopic and sometimes basiscopic auricle, this overlapping rachis; margins crenate to serrulate, sometimes more deeply incised in robust specimens; apex acute to obtuse. Veins free, evident. Sori 1--12 pairs per pinna, on both basiscopic and acroscopic sides. Spores 64 per sporangium. 2 n = 72. Flora of North America 2016.

AIDS TO IDENTIFICATION: It is a small fern with pinnate fronds, growing in tufts, with a shiny reddish-brown stipe and rachis. The fronds are dimorphic, with long, erect, dark green

fertile fronds, which are deciduous, and shorter, spreading, lighter green sterile fronds, which are evergreen (Cobb et al 2005).

ILLUSTRATIONS:
Photos and Herbarium Mounts: http://www.tropicos.org/Name/26603822?tab=images.
http://swbiodiversity.org/seinet/taxa/index.php?taxon=Asplenium%20platyneuron.
http://eol.org/pages/604469/media.

TOTAL RANGE: Southeastern half of the United States and Canada, from Arizona, Colorado, Nebraska, Minnesota, Ontario and Quebec south and east. Also occurs in Southern Africa. No other species of fern in North America has this unique distribution. An isolated population was found on serpentine soil in an oak woodland in Slovakia in 2009 (Ekrt 2010).

RANGE WITHIN ARIZONA: Known only from a few collections on the eastern and southeast slopes of Mount Elden, NE of Flagstaff, Coconino County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: A small, perennial, evergreen fern.

PHENOLOGY:

BIOLOGY: The erect fertile fronds, unusual for *Asplenium*, help release spores into the wind for long-distance dispersal, while the proliferative buds allow clonal propagation in moist, fertile habitats. The buds on the lowest pinnae allow formation of clumps with stems at several layers in the litter (EOL 2016). New sporophytes can usually grow from the gametophyte formed from a single spore. This has allowed ebony spleenwort to be an early colonizer, from distant locations, of recently disturbed habitats (Crist and Farrar 1983). This ability probably explains the long-distance dispersal and establishment of a population in Slovakia.

HABITAT: Forest floor or on rocks, in crevices, often invading masonry and disturbed soils. Arizona collections were from both deep and shallow crevices in cliffs.

ELEVATION: 0 – 4265 feet (0-1300m) rangewide, according to Flora of North America 2016. The Arizona collections however, are found from 7000 – 7300 feet (2135-2225m).

EXPOSURE: Will grow in both sun and shade (Wagner 1981).

SUBSTRATE: It will tolerate soils ranging from mediacid (pH 3.5–4.0) to subalkaline (pH 8.0–8.5), although it prefers subacid soils (pH 4.5–5.0) over mediacid. Unlike many other North American spleenworts, it can grow on soil as well as rock. When growing in soil, it can be found in forests and woodlands, including sandy pinelands, as well as old fields and other

disturbed sites. It can colonize a variety of rocks, particularly (but not limited to) calcareous ones, and will also grow on mortared walls (Wherry 1920 and Wagner 1981).

PLANT COMMUNITY: Variable throughout its range, but in Arizona occurs in mixed conifer and hardwood communities.

POPULATION HISTORY AND TRENDS: Unknown for Arizona. There are four known collections from 1978 to 1982. Two of these noted the species are infrequent or very rare. No other information is available. NatureServe considers the plant to be critically imperiled in Arizona. Elsewhere, it is considered apparently secure.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None.
STATE STATUS: None.
OTHER STATUS: None.

MANAGEMENT FACTORS: None specified.

PROTECTIVE MEASURES TAKEN: None, although the only known Arizona collection area is within the Coconino National Forest. However, *Asplenium platyneuron* is not listed as a sensitive species by the Forest Service.

SUGGESTED PROJECTS: Re-visit collection sites to determine if the species is still extant within Arizona.

LAND MANAGEMENT/OWNERSHIP: USDA Forest Service, Coconino National Forest.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Cobb, Boughton; Farnsworth, Elizabeth; Lowe, Cheryl. 2005. A Field Guide to Ferns of Northeastern and Central North America. Peterson Field Guides. New York City: Houghton Mifflin.

Crist, Kathryn Carvey; Farrar, Donald R. 1983. Genetic load and long-distance dispersal in Asplenium platyneuron. Canadian Journal of Botany 61 (6): 1809–1814.

Ekrt, Libor; Hrivnák, Richard (2010). *Asplenium platyneuron*, a new pteridophyte for Europe. Preslia 82: 357–364.

Encyclopedia of Life (EOL), accessed 5/23/2016, http://eol.org/pages/604469/details#CITEREFCristFarrar1983.

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Flora of North America (eFloras.org), accessed 5/20/2016, http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500195.

JStor| Global Plants, accessed 5/20/2016, http://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000062962?searchUri=plantName%3D%2522Asplenium%2Bplatyneuron%2522%26syn%3D1.

Markham, Kevin; Chalk, Tanya; Stewart, C. Neal Jr. 2006. " of fern and moss protein-based defenses against phytophagous insects. International Journal of Plant Sciences 167 (1): 111–117.

NatureServe Explorer, accessed 5/20/2016, www.natureserve.org.

Tropicos, accessed 5/20/2016, http://www.tropicos.org/Name/26603822.

Wagner, Warren H.; Johnson, D. M. 1981. Natural history of the ebony spleenwort, Asplenium platyneuron (Aspleniaceae) in the Great Lakes area. Canadian Field-Naturalist 95: 156–166.

Wherry, Edgar T. 1920. "The soil reactions of certain rock ferns—II". American Fern Journal 10 (2): 45–52.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

John T. Mickel, Senior Curator Emeritus, New York Botanical Garden, Bronx, NY 10458.

ADDITIONAL INFORMATION: *Asplenium platyneuron* is remarkable in that it occurs in southern Africa as well as in North America. No other North American fern has this distribution. *Asplenium platyneuron* is an ecological generalist and is particularly characteristic of disturbed woodlands. This species is migrating northward on the northern portions of its range in the upper Great Lake states (W. H. Wagner Jr. and D. M. Johnson 1981). Proliferous buds on the lowest pinnae allow formation of clumps with stems at several layers in the litter. *Asplenium platyneuron* hybridizes with *A . rhizophyllum* , *A . trichomanes* (producing *A . × virginicum Maxon), A . pinnatifidum* , *A . ruta-muraria* (producing *A . × morganii* W. H. Wagner & F. S. Wagner), *A . bradleyi* , and *A . montanum* (producing sterile *A . bradleyi*). Flora of North America 2016.

Protein extracts from *A. platyneuron* have been shown to deter insect predation on soybeans to a significant extent (Markham et al 2006).

Revised: 2016-05-23 (BDT)

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