



DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R4–ES–2020–0125; FF09E22000 FXES11130900000 212]

RIN 1018–BE41

Endangered and Threatened Wildlife and Plants; Removing *Adiantum vivesii* From the Federal List of Endangered and Threatened Plants

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to remove the plant *Adiantum vivesii* (no common name) from the Federal List of Endangered and Threatened Plants (List). Our review of the best available scientific and commercial data, including peer reviewer comments received on the 5-year status review (2008), indicate that *A. vivesii* is not a distinct species, but rather a sterile hybrid that does not have the capacity to establish a lineage that could be lost to extinction. Therefore, *A. vivesii* is not a listable entity under the Endangered Species Act of 1973, as amended (Act).

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Comments submitted electronically using the Federal eRulemaking Portal (see

ADDRESSES, below) must be received by 11:59 p.m. Eastern Time on the closing date.

We must receive requests for a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may submit comments by one of the following methods:

- (1) *Electronically:* Go to the Federal eRulemaking Portal:

<http://www.regulations.gov>. In the Search box, enter FWS–R4–ES–2020–0125, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the Search panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on “Comment.”

(2) *By hard copy*: Submit by U.S. mail to: Public Comments Processing, Attn: FWS–R4–ES–2020–0125, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041–3803.

We request that you send comments only by the methods described above. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see **Information Requested**, below, for more information).

Availability of supporting materials: This proposed rule and supporting documents, including the 5-year review, are available at <https://www.fws.gov/southeast/caribbean/> and <http://www.regulations.gov> under Docket No. FWS–R4–ES–2020–0125.

FOR FURTHER INFORMATION CONTACT: Edwin Muñiz, Field Supervisor, Caribbean Ecological Services Field Office, P.O. Box 491, Boquerón, PR 00622; telephone 787–851–7297. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other concerned

governmental agencies, the scientific community, industry, or any other interested parties concerning this proposed rule.

We particularly seek comments concerning:

(1) Reasons we should or should not remove *A. vivesii* from the List of Endangered and Threatened Plants.

(2) The location and characteristics of any additional populations not considered in previous work that might have bearing on the current taxonomic interpretation.

(3) Additional information concerning range, distribution, and population sizes, particularly if it would assist in the evaluation of the accuracy of the current taxonomic interpretation.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Please note that submissions merely stating support for, or opposition to, the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or a threatened species must be made “solely on the basis of the best scientific and commercial data available.”

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via <http://www.regulations.gov>, your entire submission—including any personal identifying information—will be posted on the website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this

information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on <http://www.regulations.gov>.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <http://www.regulations.gov>.

Because we will consider all substantial comments and information received during the comment period, our final determinations may differ from this proposal. Based on the new information we receive (and any comments on that new information), we may conclude that the species is a valid listable entity and should remain listed as endangered, or be reclassified from endangered to threatened.

Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests must be received by the date specified in **DATES**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule a public hearing on this proposal, if requested, and announce the date, time, and place of the hearing, as well as how to obtain reasonable accommodations, in the *Federal Register* and local newspapers at least 15 days before the hearing. For the immediate future, we will provide these public hearings using webinars that will be announced on the Service's website, in addition to the *Federal Register*. The use of these virtual public hearings is consistent with our regulations 50 CFR 424.16(c)(3).

Peer Review

In accordance with our policy, "Notice of Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities," which was published on July 1, 1994 (59 FR 34270), and our August 22, 2016, Director's Memorandum "Peer Review Process," we will seek the expert opinion of at least three appropriate and independent specialists regarding scientific data and interpretations contained in this proposed rule. We will send

copies of this proposed rule to the peer reviewers immediately following publication in the *Federal Register*. We will ensure that the opinions of peer reviewers are objective and unbiased by following the guidelines set forth in the Director's Memo, which updates and clarifies Service policy on peer review (U.S. Fish and Wildlife Service 2016). The purpose of such review is to ensure that our decisions are based on scientifically sound data, assumptions, and analysis. Accordingly, our final decision may differ from this proposal.

Previous Federal Actions

A. vivesii was recommended for Federal listing in an interagency workshop held to discuss candidate plants in September 1988. The species was subsequently included as a "category 1" species (species for which the Service has substantial information supporting the appropriateness of proposing to list them as endangered or threatened) in our February 21, 1990, notice of review (55 FR 6184). We listed *A. vivesii* as endangered under the Act on June 9, 1993 (58 FR 32308). We assigned the species a recovery priority number of 5, which reflected a high degree of threat and low recovery potential. We did not designate critical habitat for *A. vivesii*.

We completed two 5-year reviews for *A. vivesii*, the first on June 10, 2008 (see the announcement initiating the review at 70 FR 53807, September 12, 2005), and the second on September 25, 2018 (see the announcement initiating the review at 82 FR 29916, June 30, 2017). Both 5-year reviews recommended delisting due to the entity not meeting the Act's definition of a species.

Background

Entity Description

A. vivesii is found growing in colonies (clusters) where the rhizome (rootstock or underground stem) spreads horizontally. The fronds (leaves) are distichous (arranged in one plane) and erect-spreading with broad and irregular lance-oblong blades. The blades

have two or three alternate or occasionally subopposite pinnae (segment of leaf), with a larger terminal pinna. The terminal pinnae are stalked often somewhat inequilateral with approximately 10 to 13 pairs of alternate, narrowly oblong-falcate pinnules (smaller segments of a leaf), shaped unequally cuneate at the base. The irregularly-branched stalks are lustrous purple-black with hairlike scales. The rachis (axis of a fern leaf) and costae (central vein of a leaf) are more densely covered with hairlike scales than the stipe. The outer sterile margins of the pinna are irregularly serrulate (serrated teeth), and the tissue is dull green on both sides. Five elliptic to linear sori (sacks of spores) are borne along the basal half of the acroscopic (facing the apex) margin. The sori are also close or contiguous, but remain distinct, and the indusium flap (tissue covering the sori) is gray-brown and turgid, with an erose (irregular) margin (Proctor 1989, p. 140; USFWS 1995, pp. 1–2).

Distribution and Habitat

A. vivesii is found in the limestone or karst region of northwestern Puerto Rico. This region is underlain by limestone rocks of the Oligocene or Miocene age. Topography varies throughout the karst region, from extremely rugged to gentle rolling hills. Canyons, sinkholes, and subterranean rivers, as well as these rolling hills, are the most common features of the region. Soils in the limestone hills are shallow, well-drained, alkaline, and interspersed between limestone outcrops (Lugo *et al.* 2001, pp. 13–26; USFWS 1995, pp. 6–7). *A. vivesii* occurs within the semi-evergreen seasonal forests of the subtropical moist forest life zone (Ewel and Whitmore 1973, p. 20). This life zone, which covers 58 percent of the total area of Puerto Rico and the U.S. Virgin Islands, is delineated by a mean annual rainfall of between 1,000 to 1,100 mm (40 to 44 in) and about 2,000 to 2,200 mm (80 to 88 in) and a mean temperature between about 18 and 24 degrees Centigrade (64.4 and 75.2 degrees Fahrenheit) (Ewel and Whitmore 1973, p. 20).

A. vivesii occurs in a deeply shaded hollow at the base of a limestone hill in Quebradillas (USFWS 1995, p. 7).

When the species was listed in 1993, it was known from only one population on a privately owned limestone hill in Quebradillas. That population was estimated at 1,000 plants or growing apices by Proctor (1991, p. 5). The population was later documented at the same location occurring in an area of 21 meters (m) by 10 m (68.9 feet (ft) by 32.8 ft) by Sepúlveda-Orengo (2000, p. 21). In the vicinity of this area, eight other species of the genus *Adiantum* were found (*A. cristatum*, *A. fragile*, *A. latifolium*, *A. melanoleucum*, *A. pulverulentum*, *A. tenerum*, *A. tetraphyllum*, and *A. wilsonii*). The fern *A. tetraphyllum* was growing intermixed within the area occupied by *A. vivesii* (Sepúlveda-Orengo 2000, p. 22). Surveys conducted in 2017 at the type locality (the location where the specimen was first identified) were unable to identify material that morphologically matched the original type specimen (despite similarities), nor any clonal stand of *Adiantum* material as it had been described there in 1991 and 2000 (Possley et al. 2020, p. 6). These results suggest that *A. vivesii* is extirpated from the only known location.

Taxonomy

A. vivesii was believed to be a fern of the family Pteridaceae. It was described by Dr. George R. Proctor in 1985, from specimens collected by Miguel Vives and William Estremera at San Antonio Ward in the municipality of Quebradillas, Puerto Rico (Proctor 1989, p. 140). Non-genetic research on *A. vivesii* after it was described as a species suggested this fern is actually a single sterile hybrid plant, rather than a population of individuals of a species (Sepúlveda-Orengo 2000, entire). Excavations at different points throughout the entire “population” of *A. vivesii* found rhizome, or underground stem, connections between most of the apparent individual ferns (Sepúlveda-Orengo 2000, p. 21). Plantings of two 10-centimeter (4-inch) rhizome segments (planted in pots using the same soil from the colony location) of *A. vivesii* grew into healthy plants within about 3

months (Sepúlveda-Orengo 2000, p. 21). Production of sporangia (structures from which the reproductive gametophytes arise) was observed throughout the year, but actual gametophytes (structures containing sperm and eggs, or gametes) were not observed. The lack of gamete production but growth of fronds from rhizome segments suggests that the *A. vivesii* “population” consists of only one individual with rhizome proliferations (below-ground stems).

A morphometric analysis of *A. vivesii* and the co-occurring species, *A. tetraphyllum*, was conducted on 21 vegetative characters and one spore character (Sepúlveda-Orengo 2000, p. 22). In conjunction with the morphometric analysis, the following studies of *A. vivesii* and *A. tetraphyllum* were conducted: chromosome counts; light microscopy observations of fresh or dried pinnules, sori, and sporangia; and scanning electron microscopy (SEM) of rhizomes, fertile pinnules, and spores. The morphometric analysis showed significant differences between *A. vivesii* and *A. tetraphyllum* for 16 of the vegetative characters as well as spore size, revealing that *A. vivesii* is morphologically different. Based on the results, the morphological features that best distinguish *A. vivesii* from *A. tetraphyllum* are the number of lateral pinnae and the number of pinnules on each lateral pinna, which are fewer in *A. vivesii*. Although there are morphological differences, chromosome number in each taxon appears to be similar (Sepúlveda-Orengo 2000, p. 23), indicating *A. vivesii* is not a polyploid (possesses more than two sets of chromosomes), a common cause of sterility in plants.

Based on spore observations in the light microscopy and SEM studies, *A. vivesii* appears to be a sterile hybrid (Sepúlveda-Orengo 2000, p. 31). The greater variation in spore size in *A. vivesii* observed in these studies was mainly produced by spore abortion. These observations of sori containing abortive sporangia and spores suggested *A. vivesii* is indeed a hybrid (Sepúlveda-Orengo 2000, p. 29). Further, the forms of the spores of *A. vivesii* are different from *A. tetraphyllum* because of the collapse of the exospore (outer

layer of the spore membrane) that is associated with the absence of the protoplast (plant cell with no cell wall). Mature spores of *A. vivesii* are more compactly constructed than those of *A. tetraphyllum*, with the sporangia appearing as more or less globular objects tightly grouped together, which is consistent with the sorus (spore producing structure) of a hybrid (Sepúlveda-Orengo 2000, p. 28).

Based on the initial taxonomic analysis discussed above, *A. vivesii* does not appear to be a distinct species (Sepúlveda-Orengo 2000, entire). This analysis showed that sporangia and spores were produced throughout the year, but signs of sexual reproduction as gametophytes or small plants were not observed. The plant instead reproduces vegetatively (asexually), and the entire colony seems to be the result of vegetative reproduction via rhizomes from a single, sterile individual (Sepúlveda-Orengo 2000, pp. 26–31).

More recently, the Fairchild Tropical Botanical Garden (Fairchild) has been collaborating with the Service on the assessment of endangered ferns including *A. vivesii* (Possley and Lange, 2016 and 2017, p. 4; Possley et al. 2020, pp. 5–11). In 2017, fieldwork was conducted to assess the colony of *A. vivesii* and collect material for genetic analyses. Fairchild engaged Dr. Emily Sessa from the University of Florida (UF) to assist on a genetic study to validate whether *A. vivesii* is a hybrid as indicated by Sepúlveda-Orengo (2000, p. 29).

Leaf material for DNA extraction was collected in the field in Puerto Rico in February 2017, and from herbarium specimens, including the isotype (duplicate or very similar type specimen) for *A. vivesii*. A total of 27 specimens were sampled: 5 identified as *A. latifolium*, 2 as *A. obliquum*, 3 as *A. petiolatum*, 4 as *A. pyramidale*, 5 as *A. tetraphyllum*, 4 as *A. vivesii*, and 4 unidentified *Adiantum* individuals (Possley et al. 2020, p. 6).

The analysis found that five samples, including the *A. vivesii* isotype, had sequence variants that fell in different groups, which indicate their hybrid origin (Possley et al. 2020, p. 10). The genetic sequencing further indicates that *A. vivesii* is of hybrid origin with *A. petiolatum* as one parent and the other parent likely being *A. tetraphyllum* (Possley et al. 2020, p. 10).

The Act and supporting regulations define a species as any species or subspecies of fish, wildlife, or plant, and any distinct population segment of any vertebrate species that interbreeds when mature, but do not further define the terms “species” or “subspecies” used in this definition. Rather, per 50 CFR 424.11(a), the Service shall rely on standard taxonomic distinctions and the biological expertise of the agency and the scientific community in determining whether a particular taxon or population is a species for the purposes of the Act. The standard biological definition of a “species” is a group of organisms that are capable of interbreeding when mature. The application of this definition becomes more complicated with plant species, as many can exhibit asexual reproduction (NRC 1995, p. 50). For this reason, we consulted with experts to assist in determining the appropriate treatment for this entity (Riibe 2020, pers. comm.; Sessa 2020, pers. comm). Based upon expert input, here we are considering a species to be a distinct unit with a natural evolutionary trajectory, meaning that it has the ability to establish a lineage that could be lost to extinction (NRC 1995, p. 54; Riibe 2020, pers. comm.; Sessa 2020, pers. comm.). In the case of *A. vivesii*, it was determined to be a sterile hybrid by Sepulveda-Orengo (2000, entire), indicating that *A. vivesii* is unable to sexually reproduce and is unlikely to perpetuate into the future. This research also demonstrated that the only known population was comprised of clonal individuals resulting from rhizome proliferations, some of which eventually fragmented. Despite the extensive botanical research and inventories in Puerto Rico by the late Dr. George Proctor (former authority on ferns across the Caribbean) and other experts, *A. vivesii*

remains only known from the type locality. Additionally, during the latest field surveys at the type locality (2017), the Fairchild team was unable to locate material that morphologically matched the type specimen (despite similarities), nor any clonal stand of *Adiantum* material as described by Proctor and Sepulveda-Orengo (Possley et al. 2020, p. 6). The team collected a variety of morphotypes from the type locality for genetic sequencing at the University of Florida; however, none of the material was a genetic match to *A. vivesii*. These results suggest that *A. vivesii* is extirpated from the only known location. Recent research has confirmed that *A. vivesii* is a sterile hybrid that does not have the capacity to establish a lineage that could be lost to extinction; consequently, we have determined that it does not qualify as a listable entity under the Act.

Determination of *Adiantum vivesii*'s Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for adding species to, removing species from, or reclassifying species on the Lists. Our regulations (50 CFR 424.11(e)) state that the Secretary shall delist a species if the Secretary finds that, after conducting a status review based on the best scientific and commercial data available:

- (1) The species is extinct;
- (2) The species does not meet the definition of an endangered species or a threatened species. In making such a determination, we consider the same five factors and apply the same standards set forth as for listing and reclassification; or
- (3) The listed entity does not meet the statutory definition of a species.

Under section 3 of the Act and our implementing regulations at 50 CFR 424.02, a “species” includes any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature. As such, a species under the Act may include any taxonomically defined species of fish, wildlife, or plant; any taxonomically defined subspecies of fish, wildlife, or plant; or any

distinct population segment of any vertebrate species as determined by us per our Policy Regarding the Recognition of District Vertebrate Population Segments Under the Endangered Species Act (61 FR 4722; February 7, 1996).

Our implementing regulations provide further guidance on determining whether a particular taxon or population is a species or subspecies for the purposes of the Act; under 50 CFR 424.11(a), the Service shall rely on standard taxonomic distinctions and the biological expertise of the agency and the scientific community in determining whether a particular taxon or population is a species for the purposes of the Act. For each species, section 4(b)(1)(A) of the Act mandates that we use the best scientific and commercial data available for each individual species under consideration. Given the wide range of taxa and the multitude of situations and types of data that apply to species under review, the application of a single set of criteria that would be applicable to all taxa is not practical or useful. In addition, because of the wide variation in kinds of available data for a given circumstance, we do not assign a priority or weight to any particular type of data, but must consider it in the context of all the available data for a given species.

To determine what constitutes a listable entity under the Act, we evaluate and consider all available types of data, which may or may not include genetic information, to determine whether a taxon is a distinguishable species or subspecies. As a matter of practice, and in accordance with our regulations, in deciding which alternative taxonomic interpretations to recognize, the Service rely on the professional judgment available within the Service and the scientific community to evaluate the most recent taxonomic studies and other relevant information available for the subject species. Therefore, we continue to make listing decisions based solely on the best scientific and commercial data available for each species under consideration on a case-by-case basis.

In making our determination whether we recognize *A. vivesii* as a listable entity, we considered all available data that may inform the taxonomy of *A. vivesii*, such as

ecology, morphology, and genetics, as well as expert opinion (Riibe 2020, pers. comm.; Sessa 2020, pers. comm). Here, we considered the ability of an entity to establish a lineage that could be lost to extinction in our determination of whether the species constituted a listable entity.

After a review of all information available, we propose to remove *A. vivesii* from the List of Endangered and Threatened Plants at 50 CFR 17.12. Since the time of listing, additional studies have shown that *A. vivesii* is not a distinct species, but rather consists of a sterile hybrid with rhizome proliferations that lacks the ability to establish a lineage that could be lost to extinction. As a result, we have determined that the entity is not a listable entity under the Act.

Determination of Status

Our review of the best available scientific and commercial information available indicates that *A. vivesii* is not a valid taxonomic entity and, therefore, does not meet the definition of a species under the Act. Accordingly, we propose to remove *A. vivesii* from the List of Endangered and Threatened Plants per 50 CFR 424.11(e)(3).

Effects of This Rule

This proposed rule, if made final, would revise 50 CFR 17.12(h) by removing *A. vivesii* from the Federal List of Endangered and Threatened Plants. The prohibitions and conservation measures provided by the Act, particularly through sections 7 and 9, would no longer apply to *A. vivesii*. Federal agencies would no longer be required to consult with the Service under section 7 of the Act in the event that activities they authorize, fund, or carry out may affect *A. vivesii*. There is no critical habitat designated for *A. vivesii*, so there would be no effect to 50 CFR 17.96.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;
- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with determining a species' listing status under the Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244).

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5,

1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We have determined that there are no Tribal lands that may be affected by this proposal.

References Cited

A complete list of references cited in this rulemaking is available on the Internet at <http://www.regulations.gov> and upon request from the Caribbean Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Fish and Wildlife Service's Species Assessment Team and the Caribbean Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 1531-1544; and 4201-4245, unless otherwise noted.

§ 17.12 [Amended]

2. In § 17.12(h) amend the table by removing the entry for “*Adiantum vivesii*” under “FERNS AND ALLIES” from the List of Endangered and Threatened Plants.

Martha Williams,
Principal Deputy Director,
Exercising the Delegated Authority of the Director,
U.S. Fish and Wildlife Service.

[FR Doc. 2021-16248 Filed: 7/29/2021 8:45 am; Publication Date: 7/30/2021]