Making a Proposal to the Pennsylvania Rare Plant Forum

Background

The Pennsylvania Rare Plant Forum (RPF) is organized by the Vascular Plant Technical Committee (VPTC) of the Pennsylvania Biological Survey, to gather expertise on decisions related to the native plant conservation in Pennsylvania. The VPTC serves in an advisory role to the Pennsylvania Department of Conservation and Natural Resources (DCNR) on these issues. At the forum, proposals to change the legal conservation statuses of various taxa are presented and discussed to gather input and review from the collective botanical expertise of the group. The results of this discussion are then considered by the VPTC, who makes a recommendation to DCNR on the appropriate conservation status of the taxon.

Anyone with interest and knowledge of the native flora is encouraged to attend the Rare Plant Forum and contribute their expertise. Participants come from a variety of backgrounds, including DCNR employees, college faculty members, non-profit conservation organization staff, biologists from the private sector, and knowledgeable individuals with no related affiliation. Drawing on the knowledge, experience, and perspectives of all these sources improves the accuracy and completeness of the results.

The process of developing a proposal starts well before the forum, and we encourage collaboration with other members of the botanical community in this process. Anyone can submit a proposal, and you do not have to be an expert with a dissertation's worth of data in hand to begin the process. A proposal starts with a question about the current status of a taxon, and proceeds through gathering more information, examining the data in a specific conservation framework developed by the VPTC and DCNR, and synthesizing the results into a recommendation that reflects the best available current knowledge. We encourage people to raise questions, contact other botanists for discussion, and start to gather the kinds of information laid out in this document; even if this process does not always proceed through to a full proposal, active discussion and inquiry are beneficial to our knowledge of the flora.

RPF proposals serve two primary purposes. They communicate the data and reasoning behind the proposed change to those attending the meeting, setting the stage for group discussion. They also provide the foundation for DCNR to prepare a case for the legal process of changing a taxon's conservation status. Plant conservation statuses are listed in the regulations that implement the Wild Resource Conservation Act, the legislation that affords a degree of legal protection at the state level for plants of conservation concern.

Because the proposal, if passed, will ultimately be used as a reference for making a legal decision, it is important that the case be made explicitly, and that the information presented is comprehensive.

Understanding Plant Conservation Status in Pennsylvania

There are two essential background documents for understanding how plant conservation status is currently evaluated in Pennsylvania: the NatureServe conservation status rank definitions (Appendix 1), and the legal status definitions in the Pennsylvania Code Title 25, Chapter 45 (Appendix 2). The legal status definitions, adopted in 1993, were formulated to correspond closely to NatureServe rank definitions; however, the language is not identical.

The Pennsylvania Natural Heritage Program (a member of the international NatureServe network) is a public-private partnership that maintains biodiversity information consulted by the state in land management and permitting decisions. Aspects of PNHP methodology for tracking and evaluating plants of conservation concern are referenced frequently in the guidelines below, and a key tool the VPTC and DCNR have adopted for use in developing a proposal is the NatureServe rank calculator. Please consult the companion document "Using the NatureServe Element Rank Calculator for Preparing Pennsylvania Rare Plant Forum Proposals" for detailed instructions in the use of this tool. While PNHP's conservation framework is an important part of developing the proposal, the ultimate purpose is to recommend a legal status. The DCNR, as the legal agency responsible for plant conservation, and a partner in PNHP, provides guidance on the most up-to-date standards for interpreting the legal status definitions.

Steps in Proposal Development

1. Identify a question regarding the appropriate status of a plant taxon in PA.
2. Research the taxon further, including discussion with other botanists, literature search, and filing a data request with PNHP to review the state of known populations. Communicate your interest to the Rare Plant Forum planning committee, who can help facilitate development of your proposal.
3. Fill out the NatureServe Rank Calculator for the taxon under consideration
4. If background research and the Rank Calculator results indicate a status change is merited:
   a. Fully document the rank calculator worksheet
   b. Provide a brief written summary of the proposal, including any relevant citations.
   c. Submit the rank calculator worksheet and the written summary by the proposal deadline established by the Rare Plant Forum planning committee.
   d. Proposals receive some advance review by VPTC members, who may provide feedback to improve the proposal.
   e. Coordinate with the Rare Plant Forum planning committee to develop a brief presentation of your proposal. Typical components are range maps, photos, and the rank calculator results.
   f. Present proposal at Rare Plant Forum, discuss with group.

What Happens After the Forum?

- After the Rare Plant Forum, the VPTC meets, considers all proposals, and makes recommendations to DCNR. The RPF planning committee will follow up to notify you of the

VPTC's recommendation, which can range from accepting the proposal as-is, requesting more information, amending the proposal with justifications, or tabling the proposal contingent on further field work.

- DCNR considers the VPTC's recommendations. DCNR may accept the recommended status, or request further information and justification from the VPTC.
- If DCNR accepts the proposal, it will begin the process of legally changing the status as listed in the regulations.

PNHP staff are happy to work with you on developing any aspect of the proposal. For each topic below, the corresponding factors of the NatureServe Rank Calculator are listed in parenthesis.

Components of a good proposal

The proposal needs to address the following topics, which all relate to the NatureServe rank guidelines, and contribute to a comprehensive understanding of the level of risk the taxon faces in Pennsylvania. These topics are incorporated into the NatureServe Rank Calculator, but it is important to clearly reference and explain each topic during your proposal presentation at the Rare Plant Forum. It is also important to clearly document these topics in the written proposal materials you submit.

- Fill out the rank calculator spreadsheet, and document all decisions in the "comments" fields.
- Provide a brief written summary of the proposal.
- Range maps and photos are good elements to include in your RPF presentation

Geographic distribution, in PA and in North America (NSRC: Range Extent)

The geographic distribution of a taxon often illustrates important aspects of its ecology, and points to potential conservation issues. The North American distribution provides a sense of how common or rare the species is on a larger scale, which is important to keep in mind when considering regional conservation status. Specific distribution patterns, such as a northern-centered distribution with a southern edge in Pennsylvania, confinement to the Appalachian Mountains, or a distribution only above or below the limit of glaciation, can suggest climate and other environmental conditions that indicate threats, natural limits, or potential for expansion at the edge of the range.

It is extremely useful to include state and regional distribution maps in your presentation. North American distribution at the county level is best obtained from www.bonap.org. PNHP is happy to work with you to generate state distribution maps showing extant and historic locations.

Habitat (NSRC: Intrinsic Vulnerability)

To assess conservation status, it is important to understand the habitat occupied by the taxon, on a local and regional scale. Observations from field experience often provide subtle details or geographic specificity not available in references. On the other hand, it is also important to consult a variety of sources, including those outside of Pennsylvania, to make sure that field experience limited to a

particular area does not create a skewed impression of the habitat. Most botanists have regions of the state they know well, and others they know less well; please do not hesitate to contact the VPTC to ask botanists from across the state about their experience with a taxon. Habitat descriptions in references such as Flora of North America, New York Flora Atlas, Flora of Michigan, Flora of West Virginia, Flora of Virginia (Virginia Flora Atlas online), GoBotany.org (New England Wildflower Society) and Maryland Biodiversity project can provide regional insights.

Once you have developed an understanding of the habitat occupied by the species (to the extent possible), you can make a rough estimate of how much habitat might exist in Pennsylvania. Some habitats are extremely specific, and limited in their extent in Pennsylvania (i.e., cool moist limestone rock outcrops); other habitats are very common (i.e., disturbed herbaceous areas such as rights of way). It is frequently very difficult to quantify this factor, so qualitative description of your assessment is fine.

Biology & Life History (Background information for a variety of NSRC factors)

A Rare Plant Forum proposal does not need to include extensive elaboration of these topics, but it is important due diligence to make at least a basic inquiry into what is known about the biology and life history of the taxon under consideration. Do a search of published literature, via google scholar or other databases if you have access (if you do not have journal access, contact the VPTC for assistance). The focus of what is included in a proposal should be any information that is particularly relevant to assessing risk of extirpation; examples include mycorrhizal dependencies, pathogens, dispersal method, "conservatism" rating, etc..

Numbers of populations* statewide (NSRC Number of Occurrences)

This is more complicated than it seems like it should be, because we have to account for the state of our knowledge, which is never a perfect tally of all the plants that are actually growing in Pennsylvania. "Number of populations*" is an estimate. The basis of this estimate should be the number of documented extant populations (A population is considered "extant" if it has been observed within 20 years, unless there is additional information suggesting the species is highly transient or the population has been extirpated). This is usually the number of extant PNDI records, plus any additional records you have discovered or compiled from other sources (with appropriate ID verification).

The "number of populations" estimate can also include an estimate of how many other populations may exist in Pennsylvania in addition to the "documented extant" number above. However, this estimate should be very clearly explained, it should be as evidence-based as possible, and it may be closely scrutinized. If the number of "estimated additional undocumented extant populations" is central to the justification of the proposal, it is probably not going to succeed, simply because the data is not actually in hand. Important factors to consider may include the amount of unsurveyed habitat in the state, the difficulty (or ease) of detection and identification, and the persistence of historically documented populations.

The final number may be presented as a range estimate, i.e. "5-15 populations are likely to exist in Pennsylvania".

Number of individuals statewide (NSRC Population Size)

This is also a range estimate, based on available data that is usually fairly limited; however, an estimate accurate to order of magnitude or somewhat better is often quite useful for risk assessment at the level of conservation status. For sites you personally survey, make an effort to obtain a count of individuals at the site. For sites that you have not visited, consult the PNHP records, which often include some kind of population estimate. For each record (PNDI and any other sources) make a "high" and "low" estimate for the actual count; to get your final range estimate, sum the "low" estimates for all records, and then sum the "high" estimates for all records (more detail on this procedure is provided in the rank calculator instruction sheet).

Ecological viability of the state's populations (NRSC Good Viability/Ecological Integrity)

The numbers of populations and individuals give us a basic understanding of the current status of a taxon, but what is really important to the future of a taxon is assessing the ecological viability of the states' populations. This can be quantified using NatureServe's "element occurrence rank" system, which is a basic standard method to assess the likelihood a population will persist 20-30 years into the future based on its size, condition, and landscape context. Each PNDI record should be assigned an element occurrence rank; examine these, and present the number of populations with good, fair, or poor viability. It is also very useful to provide qualitative descriptions to contextualize the rank summaries, i.e.. "many populations have low viability because they are very small" or "about 1/3 of the populations are considered to have good viability because they are large, in excellent habitat, and well protected; 1/3 had no information available; and 1/3 had fair viability because they were large, but in isolated habitats of marginal quality." See Rank Calculator Instructions for more information.

Threats to the species (NRSC Threat Impact, Threats Worksheet)

The NatureServe rank calculator is an excellent tool for systematic evaluation of the degree of threat a taxon is experiencing. After going through the calculator threats assessment, provide a brief written summary of the results, either in the "comments" field on the main worksheet or in other summary documentation.

Trend (NRSC Short-term trend, long-term trend)

It is generally very difficult to present well-substantiated evidence of trend. New observations do not necessarily new populations, and lack of observations does not necessarily mean decline, unless the areas in question have been under long-term observation. However, indirect evidence can be powerful, such as loss of habitat, or documented susceptibility to a pathogen or other threat known to be widespread in combination with a dearth of observations. In a proposal, it is fine to state that there is no evidence available for trend, or to present indirect evidence with appropriate caveats.

*What is a "population"? – right, we were afraid you'd ask that. In this context, a population is a group of individuals growing in close enough proximity that they are likely to interbreed, if the plant

reproduces sexually. Often this can be assessed with reasonable clarity for rare plants, because clusters of individuals are widely spaced on the landscape. Sometimes, however, ambiguities do arise; an example would be a riverine species like *Trautvetteria canadensis*, where individuals might be scattered along a river shore for miles, rather than clumped tightly together into separate groups. Since in most cases, no research is available for our taxa to specifically assess their spatial population dynamics, we use the arbitrary but functional estimate that if plants are separated by more than XX, they are considered to be different populations (this is NatureServe's default separation distance for mapping distinct element occurrences). What if your taxon doesn't reproduce sexually? Well, use the default anyways; "number of populations" is useful in risk assessment in part because it provides an estimate of how many "independent" locations exist that might encounter the world's risks differently. We know that these estimates are not perfect! If your taxon has particular features which affect the usefulness of the "number of populations" estimate, please describe these in your documentation, so we can consider this factor appropriately.

Appendix I
Approximate Correspondence Between NatureServe Sub-national Conservation Ranks and Legal Conservation Status in Pennsylvania.

Subnational Rank	Definition	Approximate Corresponding Pennsylvania Status
SX	Presumed Extirpated — Species not located despite intensive searches and virtually no likelihood of rediscovery.	Extirpated (PX)
SH	Possibly Extirpated — Known from only historical occurrences but still some hope of rediscovery. There is evidence that the species may be extinct, but not enough to state this with certainty.	Extirpated (PX)
S1	Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.	Endangered (PE)
S2	Imperiled—At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.	Threatened (PT)
S3	Vulnerable—At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.	Rare (PR)
S4	Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.	No Status
S5	Secure—Common; widespread and abundant.	No Status

Appendix 2
Pennsylvania Conservation Status Definitions for Plants and VPTC Modifiers for TU

Definitions from Pennsylvania Code Title 25, Chapter 45

PX – Pennsylvania Extirpated

A classification of plant species believed by the Department to be extinct within this Commonwealth. The plants may or may not exist outside this Commonwealth. If plant species classified as Pennsylvania Extirpated are found to exist, the species automatically will be considered to be classified as Pennsylvania Endangered.

PE – Pennsylvania Endangered

A classification of plant species which are in danger of extinction throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained or if the species is greatly exploited by man. This classification also includes populations of plant species that have been classified as Pennsylvania Extirpated, but which subsequently are found to exist in this Commonwealth.

PT – Pennsylvania Threatened

A classification of plant species which may become endangered throughout most or all of their natural range within this Commonwealth, if critical habitat is not maintained to prevent their further decline in this Commonwealth, or if the species is greatly exploited by man.

PR – Pennsylvania Rare

A classification of plant species which are uncommon within this Commonwealth because they may be found in restricted geographic areas or in low numbers throughout this Commonwealth.

TU – Tentatively Undetermined

A classification of plant species which are believed to be in danger of population decline, but which cannot presently be included within another classification due to taxonomic uncertainties, limited evidence within historical records or insufficient data.

PABS Modifiers for Documenting the Nature of Uncertainty Necessitating a Status of Tentatively Undetermined

The TU category is represented in the PABS scheme by specific tentative categories using a U with a system of modifiers. The U represents a recommendation to DCNR for an official status of TU (Tentatively Undetermined). U is the first letter in the species category, followed by either X, E, T, or R to indicate the status of PX, PE, PT, or PR respectively, that best fits the species based on current data and the professional judgment of the committee. Thus, UX is "undetermined status but probably extirpated in PA". UE is "undetermined status but probably endangered in PA", etc.

The UX, UE, UT, or UR should be followed by one or more of the following modifiers to indicate the issue(s) preventing assignment to a definite category:

I—Identification of specimens is questionable.

T—Taxonomic status is uncertain.

F—Fieldwork is needed to better understand the current distribution and abundance of the species.

D—Dubious: it is unclear whether the supporting specimen(s) were actually collected within the Commonwealth.

N—Native status of the species is unclear.

H—Herbarium studies are needed.