Hidden in Plain Sight

The Role of Plants in State Wildlife Action Plans

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Citation: Stein, B.A. and Gravuer, K. 2008. *Hidden in Plain Sight: The Role of Plants in State Wildlife Action Plans.* Arlington, Virginia: NatureServe.

Cover photo: Green pitcher plant (*Sarracenia oreophila*). © Kenneth Lawless.

ISBN: 0-9711053-9-1

Printed on recycled paper.

Funding for this report was provided by a grant from the Doris Duke Charitable Foundation (www.ddcf.org).

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The Role of Plants in State Wildlife Action Plans

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March 2008

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State wildlife action plans, completed in 2005 by all U.S. states and territories, are designed to guide wildlife conservation efforts and have been described as a nationwide strategy to prevent wildlife from becoming endangered. Developed by the individual states based on the best available scientific information and on broad public engagement, these plans are increasingly important in a wide variety of conservation and planning efforts. Yet the federal guidelines governing development of these plans specifically exclude plants from the definition of "wildlife."

How well, then, do wildlife action plans consider plant species and—whether by design or serendipity—address their conservation needs? With support from the Doris Duke Charitable Foundation, NatureServe reviewed all 56 wildlife action plans in order to answer this question.

Our study found that only a modest number of wildlife action plans explicitly incorporated plant species of conservation concern into various aspects of their planning process. Just eight of 56 plans (14%) took the most direct approach of including plants on their list of species of greatest conservation need. Another way of addressing plants was through the process for identifying priority habitats. We did not find strong support for the assumption that the habitat component of these plans would effectively address plant-related conservation needs. Just six plans (11%) considered plant species of concern in their methods for setting habitat priorities.

Fewer than half the states identified specific geographic areas of particular conservation interest. Twelve plans (21%) included plant species of concern in their methods for defining these focal areas, generally relying on plant data maintained by state natural heritage programs. The final way that some plans addressed plants was through recommended conservation actions. We found that 17 plans, or about one-third (30%), included at least one action item that, if carried out, would benefit plant species of concern. In most plans, however, the number of plant-related actions was quite limited, and the proposed activities very general in nature.

The development of state wildlife action plans represents a tremendous opportunity for systematically and strategically advancing conservation in America, and the plans for Georgia, Missouri, Nebraska, and Oregon are notable for effectively addressing the needs of plant species of concern. Yet because consideration of plants was neither required nor funded through the federal State Wildlife Grants Program, the first generation of wildlife action plans collectively do not constitute a national strategy for stemming the decline of the nation's plant life and preventing additional species of native flora from becoming endangered.

Recommendations

- Promote implementation of actions and strategies for wildlife that would also benefit plant species of concern.
- Avoid implementation actions that could be detrimental to sensitive plant species.
- Add plant-specific components to existing wildlife action plans.
- Develop state-level plant conservation strategies to complement wildlife action plans where necessary.
- Ensure that plants are fully represented in major new conservation fund"d PeW"suiBS,C[CUR,,YC2URYC8[1plPr02t"dtios imcb,D"c

Conservation in America entered a new era in 2005 with the completion of wildlife action plans in all U.S. states and territories. Although differing from one state to another, the plans all are designed to provide a strategic blueprint for guiding wildlife conservation efforts. In particular, the plans are designed to protect each state's wildlife species before they become threatened or endangered. With support and guidance from the U.S. Fish and Wildlife Service and the Association of Fish and Wildlife Agencies, these plans were developed by the individual states based on the best available scientific information and on broad public engagement. These state-based plans collectively have been described as forming a "nationwide strategy to prevent wildlife from becoming endangered." [1]

With plans now in place across the country, focus is shifting to implementation—carrying out priority actions and activities. The plans are proving to be an effective means for bringing the needs of wildlife to the attention of diverse audiences. Because of their nationwide availability and federally sanctioned status, the plans increasingly are being used to reflect the needs of biodiversity and at-risk species generally, and are becoming a primary means by which conservation perspectives are built into a broad array of land use, development, and resource management policies.

The use of wildlife action plans to inform and influence such efforts is a very positive development, and one that has the potential to significantly advance conservation efforts nationwide. As these plans become embedded in a broad range of decision processes it is important to understand what the plans address, and what they do not. Of particular interest to many conservationists is the way in which plant life, an enormously important component of the nation's wild legacy, are addressed in the wildlife action plans. Indeed, plants represent more than half (56%) of species federally listed as threatened or endangered.

states like Florida and Georgia. Yet each state has a rich floristic heritage, and each has important responsibilities for conserving its plant diversity.

Why should we care about the loss of these species, many of which can only be distinguished by specialists? How many plant species are actually needed in order to provide wildlife with habitat and to perform other essential ecosystem functions? Although there is no way to accurately predict the consequences of losing any particular species, numerous past experiences suggest that loss of even relatively rare species can reduce ecosystem resilience, in some cases leading to dramatic ecosystem-level changes. For example, Fraser fir (*Abies fraseri*) is a rare tree species restricted to just seven mountain areas in the

State funding for wildlife conservation historically has come from user fees borne by the hunting and fishing communities, including such revenue sources as excise taxes on hunting equipment under the 1937 Pittman-Robertson Act, and fishing gear under the 1950 Dingell-Johnson Act. Because of their origin, these funding sources focus on conservation and restoration of game species harvested by hunters and anglers.

Concern for non-game species took on a new life in the early 1970s with passage of the federal Endangered Species Act, which created new funding opportunities directed towards protecting and recovering wildlife species in imminent danger of extinction. Most wildlife species, however, are neither the target of fishing and hunting, nor have yet declined to the point where they are eligible for endangered species protections. As a result, few traditional financial resources have been available for conservation of the vast majority of wildlife species. Nonetheless, it has become clear that investing in the conservation of species while they are still abundant is far more cost effective than carrying out heroic and expensive measures to resurrect them once they have become threatened or endangered. As in human medicine, an ounce of prevention is worth a pound of cure.

The State Wildlife Grants Program was developed in an effort to bring just such a preventive approach to management and conservation of the nation's wildlife. By addressing the needs of the many non-game species that historically have not been well-served, the program was designed to help species from becom1v0”vHing,,Yd“ŒTS1dr0U0—,,”ŒTS1D—1su2D—1w0”1ell-0.o0—1,,.e9S,R,

A Botanical Review of State Wildlife Action Plans

Eight Required Elements of Wildlife Action Plans

Congress asked states to address eight core elements in their plans in order to conserve all wildlife, with a focus on wildlife of greatest conservation need.

1. Information on the distribution and abundance of **species of wildlife**, including low and declining populations, that describes the diversity and health of the state's wildlife.

2. Descriptions of locations and relative conditions of **habitats and community types** essential to species in need of conservation.

3. Descriptions of **problems** that may adversely affect species or their habitats, and priority research and survey efforts.

4. Descriptions of **conservation actions** proposed to conserve the identified species and habitats.

5. Plans for **monitoring** species and habitats, and plans for monitoring the effectiveness of the conservation actions, and for adapting these conservation actions to respond to new information.

6. Descriptions of procedures to **review** the plan at intervals not to exceed ten years.

7. **Coordination** with federal, state, and local agencies and Indian tribes in developing and implementing the wildlife action plan.

8. Broad **public participation** in developing and implementing the wildlife action plan.

Source: Adapted from *State Wildlife Action Plans: Working Together to Prevent Wildlife from Becoming Endangered.* [5]

- included as "species of greatest conservation need";
- included in the process used to identify priority habitats;
- included in the process used to identify focal areas; or
- the subject of one or more proposed conservation actions.

We evaluated each plan against this framework, with particular attention to the most relevant sections of the plans (e.g., species of greatest conservation need lists, actions lists, and habitat and focal area definition and priority-setting methods). We also noted where plant species of concern (or plant conservation) were discussed elsewhere in a plan. Because implementation of the plans will largely take place on the ground, often in plan-defined focal areas, we also carried out a spatial analysis to document the degree to which the distribution of plant species of concern overlapped, whether by design or coincidence, with these focal areas.

To ensure accuracy in our interpretation, we sent the results of our plan assessments to the wildlife diversity and wildlife action plan implementation contacts in each state for their review and comment. In our communications with these reviewers, we indicated how we had scored their plan with regard to each framework question, and referenced the specific plan language on which this interpretation was based. We also highlighted instances of ambiguity, and requested clarification of those cases. Finally, we provided the opportunity for respondents to provide perspectives and additional information on the relationship of their action plan to the conservation of plant species in their state, including follow-on activities. A tabular summary of our plan reviews can be found in Appendix B. We are deeply grateful to the many state agency staff that took time to review our assessments and inform us of plant conservation-related developments in their states.

Plants as Species of Greatest Conservation Need

While the state wildlife action plans are intended to address the full array of wildlife and wildlife-related issues, Congress directed that they focus on "species of greatest conservation need" (SGCN). Embodied as the first required element of the plans, the determination of the SGCN list largely drives other aspects of the plan. For example, the identification of priority habitats or focal areas is largely based on what is needed to sustain species of greatest conservation need. Similarly, other elements of the plans — such as description of problems, proposed actions, and plans for monitoring—are largely derived from the needs of those species. The state agencies responsible for developing the wildlife action plans were given great latitude in how to identify wildlife species that—from that state's perspective—would be considered to be "of greatest conservation need." These lists were to include species with low or declining populations and/or those that, in the view of the state agency, are indicative of the diversity and health of the state's overall wildlife.[6]

Federal guidance noted that the lists could include species already protected under federal or state laws as threatened or endangered, and could draw from other lists of species of concern. The states were encouraged to make full and effective use of existing information resources, and at least 44 plans used species status assessments from state natural heritage programs as a key source of such information.[7] Although the states were given considerable flexibility in designating species of greatest conservation need, the guidelines were unequivocal in one regard: "these species must be fauna, and not flora." Nonetheless, several states felt strongly about the need to include plants on their lists of

species of greatest conservation need, and used alternative funding sources to do so.

Eight plans (14%) included plants on their list of species of greatest conservation need (SGCN). These consist of six states—Georgia, Hawaii, Missouri, Nebraska, Oregon, and

State or Territory	Native Vascular Plants	Plants on SGCN List	Composition of Plant SGCN
Georgia	2,981	323	Vascular plants: 264 species, 41 subspecies/varieties. Mosses: 7 species, 1 variety. Liverworts: 8 species. Lichens: 2 species.
Hawaii	1,174	628	Vascular plants: 442 species, 77 subspecies/varieties. Algae: 102 species, 7 varieties. 177 species identified as highest priority.
Missouri	2,061	632	Vascular plants: 390 species, 109 s6.0Tieties. 177 species identi

(and animals) in greatest need. Tier I species reflect those that are globally or nationally at-risk, while Tier II species may be at-risk within Nebraska but are apparently doing well in other parts of their range. Just 20 plant species passed the Tier I filter, which included species that are state endemics, listed under state or federal endangered species laws, or regarded by NatureServe as globally at risk (G1, G2, or G3).

Oregon's SGCN list of 60 plants included only species listed as threatened or endangered under the state's Endangered Species Act. These reflect the specific priorities of the state Department of Agriculture's Native Plant Conservation Program, which has jurisdiction over native plant conservation in Oregon.

Georgia was the only state to assemble a full "species technical team" to review, revise, and update the status assessments of its plant species of conservation concern. While such broad-scale reviews and updates were routine for assessing animals in many states—and reflect a signature achievement of the wildlife action planning process—Georgia was the only state to extend this level of treatment to its flora. The technical teams began with species of concern lists generated by the state's natural heritage program, and evaluated these against such factors as global and state rarity, range in Georgia, endemism, threats and trends, and importance of Georgia's efforts to the overall conservation of the species.

Plants in Setting Habitat Priorities

While the wildlife action plans were charged with identifying species of greatest conservation need, there was a clear expectation that much of the emphasis would be on the habitats that support and sustain the full array of a state's wildlife species. Indeed, with loss or deterioration of habitat as the primary cause of species declines, a focus on habitats and their conservation is essential.

The specific requirement was for the states to describe the location and condition of key habitats and community types essential to the conservation of the species of greatest conservation need. Many states used habitat as a central organizing theme in the development of their plans, recognizing the reliance of multiple species on similar habitat types. There was, however, wide variation in the approaches used for identifying and characterizing habitat types. While some states developed detailed maps of priority habitat types, and in some cases mapped out all habitats, other plans did not include any spatial information on the location of key habitats, instead choosing to address this in text format.

One argument put forth for not including plant species in the State Wildlife Grants Program legislation was that plants are primary components of habitats, and therefore would be well covered under the habitat provisions of the planning process and grants program. Although it is true that for most terrestrial habitats, plants are at the base of the food chain and provide much of the structure for shelter, it is not necessarily true that the habitats essential to animal species of concern will coincide with those of plant species of concern. To explore how well the habitat components of wildlife action plans addressed the habitat needs of plant species of concern, we reviewed each of the plans for the role plants played in the process for defining and identifying priority habitats.

Habitat was addressed in all plans, and 32 set clear priorities, emphasizing some habitats over others. Of the 32 plans that set habitat priorities, six, or 11% (Georgia, Missouri, Oregon, Texas, Guam, and American Samoa) explicitly included plant species of concern in their methods for setting the priorities (Figure 4).

The methods for setting habitat priorities varied considerably across the states. Georgia, for instance, detailed habitat requirements for each SGCN (including plants) and synthesized those descriptions to identify habitats of most overall significance to the state's species of greatest conservation need. Oregon took a fine-filter/coarse-filter approach to identifying priority habitats, with plant species of concern most comprehensively considered in the identification of the "specialized and local" habitats that embodied the fine-filter. Identification of these specialized habitats included consideration of plant species of concern among several other factors, and "rare plants" generally were mentioned in the descriptions of over one-third of them.

FIGURE 4
Use of Plants in Setting Habitat Priorities

Texas used a very different approach, focusing on priority ecoregions as well as on two priority habitats that cross multiple ecoregional boundaries—native prairies and grasslands, and riparian habitats. The prioritization of these habitats and ecoregions appears to take into account their relative importance for rare plants and plant biodiversity. Missouri followed a conservation planning approach in which explicit conservation targets were identified, which included landscapes, natural communities, and habitats. The state was divided into distinct ecological units with targets identified for each. Plant species of concern were an important component of the terrestrial assessment process used in Missouri for identifying these targets, or priorities. In Guam, best professional judgment apparently was employed to identify the three of the island's eight habitat types that were considered "most important" to the island's SGCN, which included plants. In American Samoa, "critically threatened" habitats were a priority, defined as habitats with very limited distributions, high uniqueness, rare plants, or high rates of loss.

Because a plan did not explicitly incorporate plant species of concern in their habitat priority-setting process does not nFbJCCC,C2URYC"U,Dy,"cr ments,t ecolqy \,"proc.ty-set"of1i plan\

FIGURE 5
Use of Plants in Focal Area Identification

sessments as detailed in *Drafting a Conservation Blueprint*.[10] This approach advocates the use of quantitative goals for the inclusion of plant, animal, and natural community conservation targets within focal areas. Georgia used several approaches for defining focal areas, one of which used land cover data to identify patches of relatively intact natural vegetation. Higher priority was then assigned to those patches that, among other factors, contained multiple occurrences of rare plant and animal species.

In Maine, "candidate focus areas" were distinguished by the presence of at least one of several possible targets, including rare plants, rare animals, rare or excellent-quality natural communities, or significant wildlife habitats within a good-quality landscape. Field staff then used expert judgment to determine which of these areas were of statewide significance. In New Hampshire "highest quality wildlife habitats" were identified using biological, landscape, and human impact factors. Biological factors included rare plant and animal occurrences, while landscape and impact factors included such metrics as patch size and road density. Conservation focus areas were then delineated where a number of these habitats were found in close proximity.

Some states included plant species of concern indirectly through their use of TNC ecoregional assessments in focal area designations. These assessments are based on a methodology that identifies conservation targets consisting of plant and animal species of concern, as well as natural communities and ecosystems. Alabama, for instance, directly adopted TNC terrestrial and aquatic priority areas as focal areas in its plan. Other states, such as Missouri, Illinois, and Oregon took Conservancy-defined ecoregional portfolios into account in the focal area selection process as one of several sets of partner-identified priority areas.

By Design or Serendipity: Coverage of Plants in Focal Areas

Just because plant species of concern were not explicitly used in the identification and delineation of focal areas does not mean that plants may not necessarily benefit from focal area designations, and conservation actions directed towards them. To understand the possible role that focal areas may play in achieving plant conservation goals, we carried out a spatial analysis to document how focal areas are distributed relative to plant species of concern. Our interest was in determining how plant species fared in this process, whether by design or serendipity.

In analyzing these data (Table 2), we assessed not only the proportion of plant species of concern that were included in one or more focal areas in a state, but also how "efficient" the set of focal areas was as a whole for capturing the full suite of plant species of concern. As an example, a set of focal areas covering 25% of the state that captured all plant species of concern would be regarded as twice as efficient as a set of focal areas capturing the same number of species but covering 50% of the state. In this context, an efficiency ratio (ER) was calculated by dividing the percent of plant species of concern included in a plan's focal areas, by the percent of the state covered by focal areas.

Among the states analyzed, the capture of plant species in focal areas ranged from 100% in Nebraska to 61.5% in Montana (Table 2). Not surprisingly, the top three states for inclusion of plant species of concern in their focal areas (Nebraska, Missouri, and Georgia) all explicitly used plants in their methods for identifying and defining focal areas. Nebraska scored a perfect 100% inclusion, although this represents a limited number of plant species of concern (17) and the plan defined relatively large focal areas.

Conservation Actions Targeting Plant Species

If species of greatest conservation need can be considered the drivers of many plan components, action items might be thought of as their ultimate outcome. Indeed, it is no coincidence that these plans are referred to as *action* plans. By listing numerous avenues through which conservation partners might work to conserve the state's wildlife, plans provided a springboard for a wide array of organizations and individuals concerned about wildlife to become directly engaged in conservation activities. Proposed actions varied among the plans along a number of dimensions. Actions ranged from conceptual and strategic suggestions to specific activities. They addressed planning targets as diverse as single species, entire species groups, habitat types, or particular threats. And they addressed geographic scales from the entire state to ecoregions to specific sites. Most plans proposed actions along multiple dimensions, with the intention of identifying opportunities attractive to a variety of stakeholders and partners.

In assessing the plans for plant species-oriented conservation actions, we used a generous interpretation for inclusion. We found that 17 plans, or about one-third (30%), included action items where plant species of concern were the intended beneficiaries. In addition to the eight plans that included plants in their SGCN lists, states including one or more actions focused on plant species of concern included: Alabama, California, Louisiana, Maine, Michigan, New Hampshire, Texas, West Virginia, and Wisconsin (Figure 6).

In general, even among the plans that included plants on their SGCN lists, actions targeting animal species far outnumbered those focused on plant species. Of the plans that included plants as species of greatest conservation need, only Oregon and Guam included specific conservation actions targeted to each plant on the list. Georgia indicated one or more categories of "conservation emphasis" for each of its plant SGCN. These three plans also included several actions targeting plant species of concern in their statewide or "big picture" action lists.

Nebraska and Missouri listed most of their specific actions at the focal-area level, and this is where actions for plant species of concern largely were addressed; both plans

FIGURE 6
Conservation Actions Targeting Plants

featured specific plant SGCN in focal area actions or initiatives. In its submitted plan, Hawaii included only a limited list of statewide actions for all plant SGCN, additionally discussing "rare plant" needs in the context of protected area management. Since the plan was submitted, however, the state has developed species-specific conservation actions for 177 high-priority plants. Uniquely, plant-focused actions in the U.S. Virgin Islands were directed toward the nonvascular flora, for which several territory-wide actions were listed. Vermont's actions on behalf of its plant SGCN were limited: stewardship for "rare plants" generally was advocated in several habitat summaries.

Representation of plant species on action lists dropped off even further for plans that did not explicitly include plants as SGCN. Wisconsin mentioned "rare plants" generally in a number of actions within ecological landscape and natural community summaries, with a few mentions of specific plant species of concern; these items were taken largely from prior comprehensive biodiversity planning efforts. Texas included a few actions specific to plant species in both its statewide and ecoregional action lists, drawing somewhat on a previous report on the natural communities of Texas and a prior comprehensive planning effort, the "Land and Water Resources Conservation and Recreation Plan." Other states focused on the conservation of plant species of concern only within very specific habitats or areas. For example, West Virginia noted the need for rare plant surveys in shale barrens habitat. New Hampshire hoped to "eliminate the co-occurrence of adverse trail impacts with... rare plant populations" and "protect rare plant... populations in delineated areas" within talus slope and rocky ridge habitats. California noted the need for ongoing monitoring in the Algodones Dunes area, including monitoring the status of "endemic and sensitive species" (including many plants) "with the input of regional biologists (including representatives of the California Native Plant Society)."

While a fair number of plans included at least one action targeted towards plant species of concern, in most plans the number of such actions was very limited, and the proposed activities very general in nature. As a result, stakeholders seeking guidance for plant-oriented activities and projects will generally not find a robust suite of options from which to choose.

Building Plants into Action Plans and Beyond

Several wildlife action plans consistently emerged as examples of how plant species could effectively be integrated into the action plan framework. Based on our review of 56 plans, we found the plans for Georgia, Missouri, Nebraska, and Oregon to be notable in the degree to which they addressed the needs of plant species of concern.

Georgia

With nearly 3,000 native vascular plant species, synthesizing and updating species information to determine plant conservation priorities was a considerable challenge which Georgia addressed head-on in its wildlife action planning process. Nearly 1,000 plant taxa were considered for inclusion on the state's species of greatest conservation need list, of which 323 ultimately were selected. Species assessments were coordinated by natural heritage program botanists, with a total of 60 experts participating in tasks such as defining species ranking factors and updating the status of difficult taxonomic groups. The effort was funded through an ESA Section 6 grant, with matching funds from the state's Nongame Wildlife Conservation Fund.

Georgia's determination of the "conservation emphasis" for each SGCN revealed the importance of maintaining specific critical habitat areas uniquely important to plant species of concern, in addition to the broad-scale habitat management often undertaken

for animals. Identification of priority habitats through synthesis of SGCN habitat descriptions had a similar result: in addition to important large-patch communities, such as mixed pine-hardwood forests and longleaf pine savannas, these priority habitats included many small-patch and localized habitats rich in rare plants, such as granite outcrops, cedar glades, and xeric aeolian dunes. Georgia's processes for identifying terrestrial focal areas also fully incorporated rare plant information, and many conservation actions recommended by botanical experts were ranked as high priority at the statewide level.

Missouri

Located at the intersection of prairie parklands, eastern broadleaf forests, and lower Mississippi riverine forests, Missouri contains a rich diversity of habitats. Missouri's planning process embraced this diversity by planning at the scale of the Land Type Association, a planning unit delineated by "consistent and unique ecological characteristics." Within each Land Type Association, target plant species were selected that were of conservation concern in Missouri and that had a high affinity for the association's unique communi-

contribution to their overall status. The plan targeted multiple occurrences of these species, as well as all of Nebraska's natural communities, with an emphasis on those that are endemic or of limited distribution. Nesting these and other targets within relatively intact landscape areas allowed Nebraska to delineate broad-scale Biologically Unique Landscapes.

These Biological Unique Landscapes are subject to a variety of public and private uses, and the plan sought to define actions for each Landscape compatible with these uses. For example, in the Kimball County Grasslands Landscape, one strategy was to "work with private landowners whose meadows contain the Colorado butterwphasin the Cit1the(D—1ColD"02D—1thei02D—1C 0U;u.u,"02YY

Fender's blue (*Plebejus icarioides fenderi*), an endangered butterfly found only in Oregon, feeds exclusively on lupine, including the rare Kincaid's lupine, a plant that is targeted in the Oregon action plan. (Butterfly shown on camas). / Photo © Bruce Newhouse.

Following the official submission of its action plan, Illinois developed two plant-focused supplements to the appendices for animal species in their submitted plan. One supplement includes a list of six criteria for determining plant species in greatest need of conservation, and evaluates each of the state's rare plant species against these criteria. The other supplement includes a list of 18 stresses to rare plant species in Illinois and an evaluation of the known impact of each of these on plant species in need. The supplements were designed for integration with the plan's animal data.

Utah also has plans to add a plant-focused appendix to its plan, including components such as a list of sensitive plants in the state, planning documents that exist for these species, a discussion of agency limitations on managing sensitive plants, and potential funding sources for plant conservation work.

Success Factors and Challenges

The ready availability of botanical data and staffing seems to have played a key role in many of those states that incorporated plants into their plans. The presence of a state natural heritage program within the agency responsible for the action plan appears to have increased the likelihood that plant-related issues were considered. Although the ready availability of botanical data was a success factor in some instances, a general lack of current information about many plants hinders the ability of many agencies to build these species into their planning. This is particularly true regarding current information about population trends. We should note, however, that many states were able to upgrade their overall inventory, monitoring, and data management capacity with funding from the State Wildlife Grants Program, and many of these upgrades have benefited plant-related inventory and monitoring efforts as well.

The availability of previous conservation planning efforts was another factor that tended to promote incorporation of plants into action plans. Lead by both public and private groups, a number of biodiversity conservation planning efforts have been carried out across the country, many of which fully incorporated plants in their planning framework. The Nature Conservancy's ecoregional assessments, for example, provided many state action plans with valuable information and helped inform the identification

of priority areas. Maine's "Beginning with Habitat" program is an example of a state-initiated planning effort that began prior to the action plan, and which considers the needs of rare plants along with other wildlife.

An active and botanically concerned public was another factor promoting the incorporation of plants in these plans. Public participation was a cornerstone of the wildlife action process, and interested individuals and organizations played a major role in helping to shape the outcome of the plans. In Hawaii, for instance, plants were only added to the plan's list of species of greatest conservation need following strong input from the public about the importance of native plant conservation.

The most significant challenge to integration of plants into more wildlife action plans was the exclusion of flora in the federal guidelines governing these plans, and the lack of federal funding to address plant species of concern. A number of plans made clear their interest in including plants, but were unable to do so due to the lack of dedicated funding. Beyond this obvious funding impediment, however, are other challenges that inhibited the consideration of plants in the planning efforts.

In a number of states, legal authority for rare and endangered plants is either nonexistent or rests with a government entity other than the wildlife agency with responsibility for the wildlife action plan. Such a divergence in authority and responsibility was not an insurmountable obstacle, as evidenced by Oregon's partnership approach. Nonetheless, a lack of in-house resources and expertise to support plant-related work, and weak links to plant-oriented agencies and organizations, appear to have been a barrier in some states.

One result of our study is clear. Despite the inclusion of plant species of concern in several wildlife action plans, *collectively these plans do not amount to a national strategy for keeping this important component of the American biota from declining and becoming endangered*. Unfortunately, this is but the latest example of how plant species are afforded separate but unequal protections. In this context, it is worth considering the mechanisms available for protecting plant species in order to determine the nature and magnitude of additional efforts that would be needed to ensure the survival and health of our botanical heritage.

The U.S. Endangered Species Act is perhaps the most important mechanism for protecting and restoring imperiled species in the United States. By prohibiting actions that

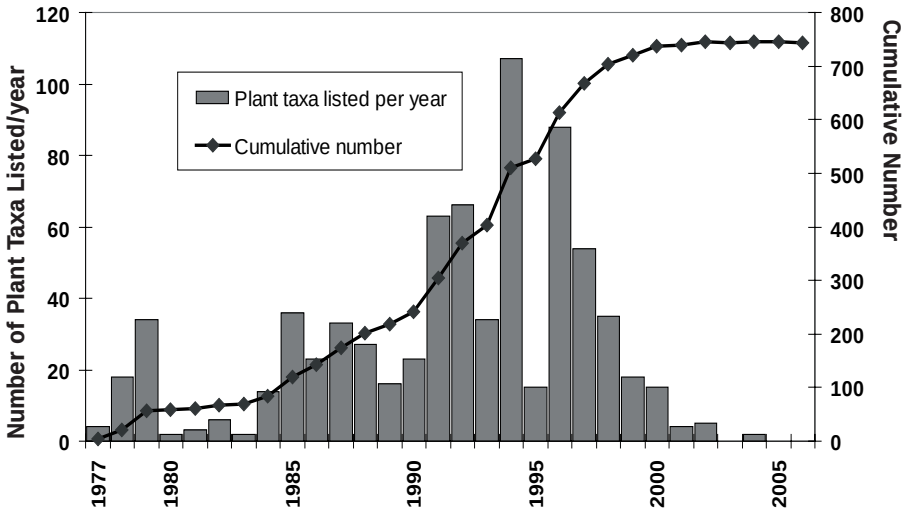

FIGURE 7
Listing of Plants Under the U.S. Endangered Species Act

FIGURE 8
Plants in State Endangered Species Laws

A few state endangered species laws extend protections to plants that exceed those provided by the federal ESA. For example, California's Endangered Species Act prohibits the take of listed plant species on privately owned property as well as public lands. Many of the plant-specific endangered species laws, however, extend only very weak or no legal protection to their listed plant species. Kentucky's Rare Plant Recognition Act, for instance, stipulates that listing "shall not serve to impede the development or use of private or public lands," and Maine's state-endangered plant list extends no legal protection at all, being "for informational purposes only." Thus, even at the state level, there is a pattern of separate but unequal protection for imperiled plant species.

Bringing Plants into Focus

The development of state wildlife action plans represents a tremendous opportunity for moving conservation in America forward in a systematic and strategic way. Our interest in reviewing these plans is premised on the belief that these plans will play an increasingly important role in directing wildlife protection efforts, and be looked to as authoritative expressions of conservation priorities. We recognize that consideration of plants was neither required nor funded through the State Wildlife Grants Program, and it is not our intention to be critical of those plans that did not include plants. Instead, we have endeavored to highlight those plans that took a proactive role with respect to plants, and attempted in one way or another to address the important conservation issues confronting the nation's flora.

While many of the nation's plant species are declining and in critical condition, focus on and funding for plant conservation seems to have ebbed in recent years, even as interest in and funding for land protection and wildlife conservation have increased. Indeed, if part of the goal of the State Wildlife Grants Program is to "keep common species common," the program is missing the opportunity to address a very significant component of the nation's web of life. Already, more than half of threatened and endangered species on the federal list are plants, and without concerted attention and action, the number of plants in need of legal protection will only grow.

We are pleased to document that a number of wildlife action plans did explicitly incorporate plant species of concern into various aspects of their planning process. A few of these were particularly notable for how they integrated plants throughout their

Risk Rank	State	Percentage At Risk	
1	Hawaii	83.2%	
2	California	30.9%	
3	Utah	17.0%	
4	Nevada	16.5%	
5	Arizona	16.1%	
6	Florida	13.6%	
7	New Mexico	12.1%	
8	Colorado	11.6%	
9	Oregon	11.3%	
10	Georgia	10.1%	
11	Alabama	9.8%	
12	Texas	9.8%	
13	North Carolina	8.7%	
14	Washington	8.1%	
15	South Carolina	8.0%	
16	Alaska	7.6%	
17	Idaho	7.4%	
18	Wyoming	7.2%	
19	Tennessee	6.3%	
20	Virginia	5.3%	
21	Mississippi	5.0%	
22	Montana	4.8%	
23	West Virginia	3.9%	
24	Louisiana	3.7%	
25	Arkansas	3.5%	
26	Maryland	tucky26	Maryland

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