SOUTHEAST EXOTIC PEST PLANT COUNCIL

SE-EPPC INVASIVE SPECIES GRANT REPORT

EXLORING SE-EPPC CHAPTER PLANT LISTING METHODOLOGIES, USE OF EDDMapS, AND PERCEPTIONS OF CWMAS/CISMAS

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PROJECT BACKGROUND

The Southeast Exotic Pest Plant Council (SE-EPPC) received a U.S. Forest Service (USFS) grant in June of 2011 to explore plant listing methodologies used by chapters, stakeholder use of EDDMapS, the status of Cooperative Weed Management Areas (CWMAs) in the southeast, and ideas for sharing chapter information. The SE-EPPC and USFS partnership is forged in the interest of preventing and reducing non-native invasive plant infestations across the southeastern states.

SE-EPPC has served as an information clearinghouse for invasive plant issues and serves as the umbrella organization for State Exotic Pest Plant Councils from Georgia, Alabama, Florida, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee.
The four tasks associated with the grant project include:

1. **Provide personnel familiar with State EPPC organizations to collect the methodology used to generate state non-native invasive plant lists from all participating State EPPC organizations.** This listing information is to be posted on the SE-EPPC website to provide a comparison of state listing methodologies as well as enhanced transparency regarding the listing process.

2. **Provide personnel familiar with Early Detection & Distribution MAPing System (EDDMapS) to assist in development of means to achieve systematic data entry into EDDMapS by SE-EPPC participating States and Agencies.** This task really requires stakeholder feedback regarding their use of, experience with, and ideas for increasing the widespread adoption of EDDMapS across the southeast.

3. **Provide personnel to develop protocol for yearly sharing of new invasive plant listings in SE-EPPC participating States.** While this is already done in some regards, the Council is soliciting means of improving information sharing through a particular process.

4. **Provide personnel to develop strategy for increasing number of Cooperative Weed Management Areas across Southeast.** Develop ideas and recommendations for increasing the number of functioning CWMAs present in the southeast.

All of these tasks are really, at the core, reliant on stakeholder feedback in regard to plant listing methodologies, use of EDDMapS, CWMAs, and information sharing. For this reason, the Council decided that a brief stakeholder survey would be an excellent means of gaining information about SE-EPPC chapter members' use of tools and resources. In addition, interviews with experts in the field will provide a foundation for background information and further recommendations.

The survey, though under a tight timeline, is intended to provide in-depth feedback from SE-EPPC members and stakeholders. Survey results will provide the council with a better understanding of stakeholder experiences and use of available tools and resources.

ACKNOWLEDGEMENTS

Invasive plants pose considerable threats to local economies, recreational opportunities, and native plants and wildlife. The SE-EPPC appreciates the opportunity provided by the USFS to move forward with tools and resources to address and prevent invasive species invasions. Also, the SE-EPPC board and chapter presidents played a vital role in providing information, feedback, and soliciting stakeholder feedback via the survey. Many of these board members are volunteers who graciously give their time to the cause. Special thanks to Nancy Loewenstein, Karen Brown, Chuck Bargeron, Karan Rawlins, and Brian Arnold. Finally, Kevin Willis began work on this project, and provided significant contributions to the state plant listing methodologies section (Part One).

METHODOLOGY

Given the different tasks associated with the project, each required a slightly different approach. For task one, providing a comparison list of each SE-EPPC chapter's invasive plant listing methodology, the strategy utilized was to interview the individual most knowledgeable of plant listing processes for each chapter. Since the information was compiled over a year ago and had not yet been vetted by each chapter, to ensure accuracy it was sent out again in October to each chapter. Two documents were then generated: 1) a more comprehensive outline-style document

of the information provided by each chapter and 2) a condensed table with only the essential information for each chapter. This table will be posted on the SE-EPPC website.

For task two, assessing EDDMapS use and feedback, the strategy began as a report with recommendations by Kevin Willis. The essence of the task is to assess who is using the EDDMapS tool and explore their experiences and feedback. For this reason, the Council decided to conduct a stakeholder survey. While general information and background is provided (largely from the initial report), the core of the data and recommendations stem from the stakeholder survey results.

The focal point of task three was soliciting ideas for how to best share invasive plant list updates and weed alerts from each SE-EPPC chapter in a more consistent manner. While sharing is currently done in various ways (e.g., chapter websites, SE-EPPC website, *Wildland Weeds*) the Council is seeking to adopt a better coordinated process for all chapters to follow. The methodology used for this task was to ask for ideas from board members and form recommendations based on their ideas while avoiding the creation of additional work. The system is already in place to adopt more consistent sharing, a process needs only to be set in place and adopted by the group.

For task four, regarding the status of CWMAs in the southeast, the methodology used to form recommendations was based on interviews with experts in the field. These interviewees included Nancy Loewenstein, Stephen Enloe, Karan Rawlins and Chuck Bargeron. Each interviewee was asked similar questions about their opinions regarding the differences between CWMAs in the west vs. the east, the status of CWMAs in the southeast, reasons why there were so many differences (e.g. a general lack of successful CWMAs in the southeast), and ideas for tangible solutions to improve CWMAs in the southeast in the future. In addition, there were questions on the survey regarding CWMA-type organizations requesting information on experiences and recommendations of stakeholders. These interviews with experts in the field and survey data results were compiled into recommendations in Part Four.

The stakeholder survey included questions dealing with each of the four tasks, though the EDDMapS questions were the most numerous. The SE-EPPC board served as the panel of experts for brainstorming and vetting question content, language, and organization. After the questions were finalized, an online survey was created using Survey Monkey. After nearly two weeks (November 3-November 15), the survey data was downloaded and analyzed utilizing SPSS

software (quantitative data) and Weft QDA (qualitative data). To save space, the unabridged qualitative responses are provided in a separate spreadsheet entitled "SE-EPPC Survey Qualitative Responses."

GENERAL SURVEY RESULTS

The stakeholder survey was sent to each of the SE-EPPC Chapter presidents for dissemination to their ListServes/email lists. It was also sent to the SE-EPPC ListServe (though there was overlap, it was decided to err on the side of caution to make sure they were included). In total, there were 227 respondents as of November 15. Once incomplete responses were removed (e.g,. only a couple of questions answered), there were 220 remaining.

The following survey results concern general findings about the respondents, their organizations, and their level of activity with their SE-EPPC chapter. The rest of the survey results are reported in the section that involves the topic most pertinent (e.g., plant listing, EDDMapS, sharing efforts, or CWMAs). A complete record of all qualitative responses (open-ended) is included in a separate document (see "SE-EPPC Survey Qualitative Responses").

Of the 220 respondents, nearly half were from Florida (47%, n=104). Following were Georgia (15.5%, n=34) and Alabama (14.5%, n=32). From there, a marked decline in responses with 8% from South Carolina (n=17), 4% from Kentucky (n=8), 4% from North Carolina (n=8), 4% from Tennessee (n=8), 2% from Mississippi (n=5), and 2% from "other" states. While there were many respondents from Florida (likely due to the large number of active individuals on the FL-EPPC ListServe), all of the SE-EPPC states are at least represented in the survey results, a difficult feat given the tight timeline and number of contacts. Respondents from "other" states indicated that they represented Nebraska, Texas, Louisiana and Hawaii.

Respondents were asked what organization they represented within their SE-EPPC chapter, with the intention of exploring the public vs. private sector make-up of SE-EPPC participants. The most numerous type of organization was a public entity or agency (n=97), which included federal, state, county, city, and municipal governments. Following public agencies was private citizens (n=53). It is important to note that respondents were asked to write in their organization, and in many cases, wrote in multiple identifies (e.g. "state agency and private citizen," or "interested citizen and business owner"). Thirty respondents indicated that they represent a Non-Governmental Organization (NGO) such as a particular chapter of the Native Plant Society, an EPPC chapter, or conservancies. An additional 26 respondents reported

affiliation with a University (e.g., faculty, student, Extension Service). Finally, 22 of the respondents indicated that they were in the private sector, most of which were environmental consulting firms, vegetation management companies, or herbicide applicators.

Regarding how active each respondent reported to be in their SE-EPPC chapter, 28% thought themselves to be "somewhat active" (n=62) followed by 24% being "not at all active" (n=53). While these responses are self-reported and not physically observed by an outside party, the number of those who consider themselves "not active at all" is interesting, given that this organization is largely a volunteer effort. See *Figure 1* on the following page for a breakdown of responses.

Individual Level of (self-reported) Activity with SE-EPPC Chapter	Percentage & frequency
Very active	13.2% (n=29)
Somewhat active	28.2% (n=62)
Neither active nor inactive	16.8% (n=37)
Somewhat inactive	17.7% (n=39)
Not at all active	24.1% (n=53)

Figure 1: Reported level of activity with SE-EPPC chapter

EXECUTIVE SUMMARY

PLANT LISTING

Where purpose statements are currently included with chapters' lists, they consistently emphasize education, management guidance, and a non-regulatory nature throughout the region. In addition, a companion-document, clearly showing a decision-tree, flowchart, and/or criteria for species lists for each state, has become common. Transparency and defensibility of the listing process follow. It is highly recommended, therefore, that all chapters use these experiences to provide, with their lists:

1) A clear statement of purpose, to include:
 a) Education, management, and non-regulation, along with
 b) A publicized ranking protocol that promotes public understanding and list objectivity.

List structure varies from state-to-state. Each chapter approaches the details of its list as their immediate and foreseeable needs require. Some consistency in list structure across the southeast

will support a broader scale approach to common problems, while chapters' ability to effectively address their unique issues remains paramount.

A relatively simple way to increase chapter listing methodology transparency would be to prepare and make accessible a guideline for interested parties on the listing process. This guideline should be easy to use and provide the reader with a comprehensive understanding of how species are grouped or listed. A map of different regions in the state is also a helpful way to depict ways in which states categorize different species.

The following attributes have been compiled from the list methods and experiences of all chapters of SE-EPPC: 1) Category (severity of threat); 2) Species' physiognomy, land- and cultural-use significance, and/or general habitat descriptor; 3) Eco-region, physiographic, or climatic province where species occur; 4) Regulatory status of species: federal (if any), home state, and neighboring states ; 5) Distribution maps directly accessible as links to EDDMapS; 6) Risk assessment protocol outlines; 7) Management recommendations for species; 8)Criteria worksheets.

The survey respondents were asked their opinion regarding whether or not increased consistency among states' invasive plant listing methodologies (e.g., whether an invasive plant is considered a high, medium, or low risk) would be an improvement. Of the 164 who answered the question, a strong majority reported that they thought states' should have increased consistency in listing methodologies (57%, n=93), followed by 37% believing that "maybe" it would be good (n=61) and only 6% (n=10) indicated that it would not be an improvement.

As a follow up question, respondents were asked to write in the pros and cons of increased consistency among states' invasive plant listing procedures and criteria. Fifty-four respondents wrote in "all pros" about increased consistency. Those in favor most commonly indicated that consistency was positive, it provided a more defensible list, and raised awareness. Forty respondents wrote in both pros and cons to increased consistency, and while the pros were much like those previously mentioned, the cons included the different conditions associated with different states, economic impacts, and the additional work required to make the methodologies more similar. An additional 25 respondents wrote in only cons, and were not in favor of increased consistency.

Respondents were asked if they thought that the invasive plant listing process was controversial in their state. While many who are interested in the issue and on the ListServe may not be very "active" on the board or with listing procedures, the board thought it would be interesting to measure perceptions of controversial listings. Given that the highest responses was "do not know" (47.5%, n=77), it is clear that most of those represented are not active or knowledgeable in the listing process. This was followed by 27% who indicated that there had been listing controversy (n=44) and 25% who thought that there had not been controversies (n=41).

Respondents were asked if, to the best of their knowledge, their state chapter experienced good participation in listing activities. A strong majority of 59% (n=92) indicated that they did not know, followed by 33% believing that they did have good participation (n=52) and 8% that their state chapter did not have good participation in listing activities (n=13).

EDDMAPS

EDDMapS is a very valuable tool for reporting new occurrences of invasive species and tracking known populations. Of the 151 survey respondents who answered the question, a strong majority of 58% (n=88) reported that they did use EDDMapS. This was followed by 24.5% (n=37) who do not use EDDMapS and an additional 17% (n=26) who "did not know" if they used EDDMapS (which suggests that they do not). The following five questions were answered only by those responded that they used EDDMapS (n=88). When asked how often they used EDDMapS, 41.5% reported that they use it "sometimes," which was followed by "frequently" and "not very often."

Respondents were asked an open-ended question about any issues that they have experienced with EDDMapS. Of the 67 who wrote in a response, 50 of them responded that they had not experienced any issues with the resource. Many of them included comments about how much they appreciated EDDMapS or had an issue that was resolved quickly. Seventeen of the respondents did report an issue. These comments were either general such as *"a few glitches now and then"* or focused on a particular issue such as "*yes, specifically with the iphone app."* There were also comments about issues that had been resolved.

Next, respondents were asked if they themselves or their organization utilized outputs from EDDMapS (most commonly in the form of maps or excel spreadsheets). Forty-four percent of

the 85 who answered the question responded that they did utilize outputs (n=37), compared to 34% who did not (n=29) and 22% that did not know (n=19).

Finally, respondents were asked what three things could be done to increase their use of EDDMapS. This was an open-ended question that all survey respondents were asked to provide a written response for (e.g., not just those that indicated that they use EDDMapS), of which 68 responded. A majority of respondents provided a comment about *"finding time to use [EDDMapS]"* knowledge, or awareness regarding EDDMapS usage (n=45). Some respondents (n=23) provided specific entry or output suggestions while others regarded work load or funding (n=14). Finally, comments were provided regard the EDDMapS app or mobile device (n=10) as well as information-related (n=10) such as suggestions to send more email updates, alerts, etc.

Many SE-EPPC and state chapter supporters and participants are using EDDMapS as a data entry tool. However, there seems to be a barriers regarding available time, perceived work involved in using the tool, and confidence required to ensure that users understand how it works and can take advantage of the resource and its benefits. Though nothing can really be done about the individual's time available to use EDDMapS, it is apparent from the survey results that there are opportunities for enhanced awareness, know-how, and advertising of the resource. Survey results also indicate that many users are not aware of the outputs available. This may be alleviated by the aforementioned recommendation to both advertise more and provide more training opportunities.

SHARING

While most chapters do share updates to invasive plant lists as well as new listings and Weed Alerts, there is no standard practice yet adopted by SE-EPPC to promote a more coordinated effort for sharing information. In consultation with the *Wildland Weeds* editor, and without creating any additional resources for sharing when there are adequate ones in place, the recommendation is to utilize specific editions of *Wildland Weeds* in order to facilitate a more coordinated sharing effort. This is the official quarterly publication of the Florida and SE-EPPC Councils and all affiliated chapters.

Survey respondents were asked if they thought this would be a good idea to promote more sharing of information. Of the 133 that responded, over 90 indicated that it was a positive idea that would likely lead to better coordination and awareness of invasive plant listing activities.

Very few indicated that they did not think this was a positive addition (process). Other ideas to promote a more consistent sharing process included promoting an online resource or website (n=37) such as ListServes, social media, and the SE-EPPC website. An additional 49 provided "other" suggestions including reaching out to other groups such as foresters, partner organizations, land managers, anglers, hunters, legislatures/policymakers, etc.

CWMAS

Based on interviews with experts in the field, the status of Cooperative Weed Management Areas (CWMAs) and Cooperative Invasive species Management Areas (CISMAs) was explored. It was determined that the following 11 factors were important to the status of CWMA-type organizations in the Southeast (especially compared to the West): 1) Organization: There are no County Weed Supervisors in the Southeast; 2) Lay of the land: Most of the open land in the Southeast is forest; 3) Lack of government ownership/ownership patterns; 4) No motivating sense of crisis; 5) Lack of funding; 6) Lack of leadership ; 7) Absentee land ownership; 8) Policy is way behind in the Southeast; 9) Different concepts of CWMAs; 10) Differences in size, circumstances and culture; 11) Florida is different (an exception to the rest of the Southeast).

Survey respondents were asked a few questions about their thoughts and experiences about CWMAs/CISMAs in their respective states. First, they were asked an open-ended question regarding whether CWMAs/CISMAs existed in their home state and if so, if they knew how many. Of the 91 respondents who answered, 60 reported that there were CWMA-type organizations in their state. Respondents were asked what they thought were the three barriers, if any, to implementing successful CWMAs in their state. This was an open-ended question that yielded 69 responses. Of these, the majority suggested that funding or resources were the number one barrier (n=66), which included such comments as "*sustained funding*," "*staff shortages*" or "*funding for dedicated oversight of program."* There were 20 comments regarding a need for enhanced communication or education, which could include simply knowing about the existence of CWMA-type organizations, general awareness of the issues, or related policies. Respondents provided 17 comments focused on leadership, or more specifically, a lack of leadership or "champions" for the cause. There were an additional 16 comments regarding the need for collaboration. Examples of collaboration comments included: "*Getting diverse groups to work together*," "*Lack of interagency coordination*," and "*lack of 'buy-in' with private and local gov't land owners.*" In addition, there were 27 comments regarding other topics.

Respondents were asked to select from a number of ideas on how to improve the number and success of CWMAs/CISMAs in their home state. They were also encouraged to write in other ideas. Thirty-three percent (n=73) of respondents indicated that sustained funding would be the most important measure. This was followed by education and awareness on invasive plant issues as well as CWMAs/CISMAs themselves.

Finally, respondents were provided space to write any other ideas they might have to improve the number and success of CWMA-type organizations not just in their home state, but across the Southeast. The 53 responses were varied, but among the most comments were comments and suggestions about funding, outreach and communication, leadership, increased coordination, awareness, and centralized structure.

PART 1: PLANT LISTING METHODLOGIES

Understanding SE-EPPC chapter plant listing methodologies to move toward increased consistency and collaboration between states

By Kevin Willis (2011) with edits and updates by Kate Wilson (Oct/Nov 2012)

INTRODUCTION

Developing and maintaining lists of problem invaders has become a primary objective for state Exotic Plant Pest Council's (EPPCs). Each chapter member of Southeast-EPPC (SE-EPPC) currently maintains a list for their state, and their histories are widely varying. In the past, listing efforts have relied on expert opinion from many contributors, based on their experiences in various areas, environments, and administrative arenas within each state. The overwhelming current trend, when working to update species and categories, is to codify the rendering of this expert opinion with a methodical criteria-based decision tree for each species under consideration.

Given the sheer numbers of potential exotic invaders, it became necessary to prioritize species. Because not all exotic species are invasive problems, deciding whether to include a species on the list is the fundamental acknowledgment of its invasive status. There is also a need to further rank invasiveness within the list; all state EPPC's assign each species to a category that denotes

its impact. There are typically 2-3 hierarchical categories for known problem-species, along with a "Watch" or "Alert" class for taxa whose range or habits are unclear, but indicate a potential for being an invasive problem in the state.

Refinements have been made by each chapter to suit their individual needs. One common theme has been the need to analyze the list in a context of regional ecology within a state. State boundaries invariably include many different environments, where species will exhibit different responses. As a broad example, montane areas will present constraints and opportunities that may be very different from those of the Coastal Plain. Invasive species will vary accordingly in their incidence and impact. At a state and regional level, due consideration of these differences helps prioritize an invader's status and an appropriate response.

Exotic Councils have exercised various approaches to generating and updating their lists. From a strong individual-led effort with advised input, to stakeholder-group oligarchy, the continuum includes varying degrees of individual ownership and committee review. Though the balance of these varies from state to state, elements of both are a constant. As lists become more refined and are regularly updated, more shared responsibility may become a necessity, with regard to time and effort involved.

As more individuals become involved in the process, and lists become increasingly used and scrutinized, a need for consistency likewise becomes increasingly important. This is true not only within the state EPPC context, but also across chapters for the southeast region as a whole. The experiences of other organizations provide several examples, and show how the current trend of criteria-based list protocols may support such consistency.

In 2003, California EPPC (Cal-EPPC) published an intensive protocol for reviewing the state's potentially invasive plant taxa. After reviewing several existing ranking systems for invasives, Cal-EPPC adopted the model then in development by The Nature Conservancy (Morse et al., 2004). The California document was drafted in response to the increasing use, publicity, authority, and potential controversiality their list was subject to, since its inception in 1992 (Cal-EPPC, 2003). Prior to Cal-EPPC's criteria-based protocol, the statewide invasives list was published (Cal-EPPC, 1994) and updated twice using the expert and professional opinions of weed scientists and land managers. One primary purpose of the 2003 protocol was to provide

scientifically defensible list decisions, with suitably objective criteria, in the event of future challenges. With the list's rising prominence in land management decisions, especially species and planting restrictions, challenges were envisioned as a potential threat to invasive exotics work in California. Applying uniform criteria for listing species provided the necessary high standards for the list.

Closer to home, similar circumstances initiated the development of systematic invasive-list review in Florida. In 2000, the University of Florida's Institute for Food and Agricultural Safety (IFAS) published a categorical assessment method for determining species' invasiveness (Fox et al., 2009), using the Florida EPPC's (FL-EPPC) longstanding list as a starting point. Growing concern over list use and defensibility, along with a need for more consistency and scientific credibility, provided the rationale for the IFAS system. The protocol requires a weight of documented evidence that subject species are, in fact, invasive. The method has corroborated many of FL-EPPC's original species designations; however, tension exists for other listed species where documentation is insufficient to reflect anecdotal experience, or indicates a lesser degree of actual invasiveness.

In addition to ranking species with known populations in the state of Florida, the IFAS methodology includes a predictive tool for analyzing suspected problem species known to occur in similar environs or nearby. While it is functionally independent of the assessment criteria for existing populations, this risk analysis segment may be indicated by the decision tree for species about which there is a level of uncertainty. It may be beneficial to join assessment of risk to the normal process of ranking species in this way, allowing for more timely response to incipient problems.

IFAS recognizes that full use of its protocol will incur financial and time costs (Fox et al., 2003). Implementation has therefore been made somewhat scalable. Ultimately, the potential for the IFAS methodology to lag behind the problem, due to lack of documentation or inadequate staff and funding commitments, is thought to be offset by its ability to provide consistency and resolve potential conflicts within land management circles, and across the range of stakeholders in the listing process.

The potential for conflict where such lists are concerned should not be underestimated. An illustration is provided by the example of the State of Virginia's Department of Conservation and Recreation (DCR) list contentions (Heffernan et al., 2001). In 2000, the American Seed Trade Association (ASTA) filed a complaint, through legal counsel, in response to DCR's use of its invasive species list to discourage use of certain species, albeit in a non-regulatory context. In addition to financial and economic arguments, the complaint challenged the invasive character of several listed species as unfounded. The Department responded to this challenge by compiling empirical data and modeling research on the species in question, and adopting a systematic methodology, using standardized criteria to which each species in question was subjected for verification. The DCR system followed on the work of many ranking models, but particularly that of the Association for Biodiversity Information (Randall et al., 2001), citing its "broader scope" and robustness after many rounds of testing. In the final stages of the process, representatives from ASTA and other members of the state's horticulture sector were included in the review (as they had previously been); the process confirmed the invasiveness of ten of the eleven species challenged.

More recently, these similar protocols have been synthesized by NatureServe (Morse et al., 2004). The significant functions and criteria are incorporated and distilled to reduce the time required to complete each species' review. This protocol both encourages documentation, and accepts expert opinion where necessary. The geographic scope is comprehensive, yet scalable for more specificity. Most state chapters of SE-EPPC are now using criteria and methods derived, at least partly, from the NatureServe 2004 protocol (Tennessee EPPC, 2009; South Carolina EPPC, 2011; Mississippi-EPPC, 2010).

SE-EPPC LIST COMPARISON BY CHAPTER

Notable details of state EPPC chapters listing methods are reviewed below, in alphabetical order by state. This list is more comprehensive than the table that follows, and as such, the table is meant for publication on the website as a reference guide to SE-EPPC chapter's plant listing methodology.

Alabama Invasive Plant Council (ALIPC)

1) List structure

- Species are initially grouped by physiognomic class

- Species are attributed with multiple characters
    - Ornamental or crop, AND/OR…
    - Category 1: widespread, dense infestations occurring in two or more regions of the state;
    - Category 2: scattered/localized infestations in AL
    - Watch: recent free-living populations in the state, and/or history of invasiveness elsewhere, and/or cultivated in the state
- Each species attributed with regard to 8 land-/water- use categories

2) List purpose

- To rank species based on their invasive characteristics.
- Foster early detection of invasive plants so that landowners, managers and land stewards can implement a rapid response action to prevent them from becoming established and spreading
- Educate the general public, land based and water-use resource managers, landowners, and plant growers in an effort to limit use of invasive plants in landscaping, restoration and other land uses
- No regulatory authority

3) Approach/Background

- Uses contributed expert opinion, AND…
- Criteria, modeled after TN-EPPC and MA 2005 report (severity categories 1 & 2)
- Does not rely on geological range or economic impact
- Watch lists A & B
- Criteria reference 5 sub-state regions (species ecological amplitude), but list is not segregated or attributed by region
- Membership is queried periodically for recommended additions to the list or change in a species' ranking
- Suggestions are researched by the Plant Listing committee, with additional input from experts across the state.

- Species meeting the criteria of the list are presented to the Board of Directors (BOD). Note: to meet the criteria, more emphasis is placed on obtaining documented evidence of infestations from EDDMapS or herbaria specimens (Alabama Plant Atlas; http://www.floraofalabama.org/). If experts or ALIPC members report infestations of new species and suggest the species be listed or bumped in rank, they are asked to map and document the infestations to reduce the use of anecdotal evidence.

- Majority approval vote of the BOD (with members from numerous stakeholders across the state, including the Green Industry) is required to accept proposed changes to the list

- Spring 2004: began with a potential list of 400 invasive species in SE region, for review and comment by ALIPC members; low response (like MS experience, Gary Ervin pers. comm.), but indicated coming contentiousness

- Fall 2004: Subsequently reduced the list to 100 species indicated by herbaria review county-by-county, and ranked using TN-EPPC model; 'heated debate' on board regarding widely planted species(ornamental and soil stabilization species) and the number of species to be listed; returned to committee for revision

- 2005: 'Cultural Use' sectors devised, sent to members/experts for review

- Fall 2005: More conflict over potential dilution of the list by common weeds (e.g., crabgrass, nutsedge), lack of native substitutes for soil stabilization ; MA guidelines adapted to provide structure, transparency of criteria and purpose of list

- 2006: Yearly process determined for additions/deletions: include all members, list-committee researches suggestions, board votes on committee's species recommendations, finalized list is presented to membership at annual meeting (Note: the yearly process has proven ineffective and unobtainable. Revisions on a 2-3 year basis are much more practical goal; although currently we're on the 5-year plan.) To bring attention to plants that have been suggested for inclusion on the list and provide an avenue for discussion, a 'Plants of Interest' list (with details about each species) was developed for internal use.

- Lessons learned:

    - Land use and plant use categories are important for analysis and understanding the interplay between plant use and invasion

    - Research and development needed to find native substitutes

    - Watch lists are important for EDRR and education, research and development needs, etc.

- Should engage entire membership for best results

- 2007: EDRR species and new additions to the list in 2007 were publicized with a separate brochure/publication ('2007 Plant list additions')

- 2012: Revised list approved by the Board of Directors (see 2012 Plant List Additions" on ALIPC website)

Florida Exotic Pest Plant Council (FL-EPPC)

1) List structure

- All species are assigned to either:
  - Category 1: 'altering native plant community through…displacement,…changing structures/functions,…hybridizing/natives
  - Category 2: increased abundance or frequency, but not as bad effects as category 1
- Does not rely on geographic range (or economic impact)
- Species attributed with regulatory classification, and region of incidence
  - Regulatory: Prohibited aquatic (FL Dept. Ag. Consumer Serv.), and/or Noxious weed (FDACS), and/or Noxious weed (USDA)
  - Region: Northern and/or Central and/or South (roughly = USDA growing regions)

2) List purpose—'To focus attention on—'

- Adverse effects on FL biodiversity/plant communities
- Habitat losses from exotic infestations
- Effects on endangered species (through habitat loss and alteration)
- Need to prevent habitat loss through pest plant management
- Socio-economic impacts of pest plants (like increased wildfires)
- Changes in seriousness over time
- Provide information to help managers prioritize control programs
- No regulatory authority
  - But encourage use of list to support regulations locally, and will suggest additions to FL regulatory authority and lists (aquatic and noxious)

3) Approach/Background (David Hall pers. comm.)

- Relies on expert opinion
- Supported by mapping and database records: FLEPPC database, Univ. of S. Florida's Atlas of Fl Vascular Plants, Fl. Nat. Areas Inventory database, Floristic Inventory of So. Fl (Institute for Reg. Cons.)
- Updated every 2 yrs (100% record), most recently in 2011
- FLEPPC sponsors a liaison committee with the FL Nursery, Grower, and Landscaping Assn.

Georgia Exotic Pest Plant Council (GA-EPPC)

1) List structure

- 4 categories,+1 subcategory
    - Category 1: Extensively invading GA natural areas plant communities and displacing native species
    - Category 1, Alert: Not yet…but significant potential to become serious problem
    - Category 2: moderate problem (lesser than category 1)
    - Category 3: minor GA problem, or unknown in GA but problem in adjacent states
    - Category 4: exotic, but not problem in GA nat. areas; or species needs more info/documentation
- No other attributes
- No reference to regional variation in decision-making or species-list attribution

2) List purpose

- To "identify and categorize plants that pose threats to natural areas in Georgia"
    - Natural areas are those areas that are managed to conserve or restore the native plant communities
    - For this list, invasive plants do not include plants that are only problems in agricultural or pastoral systems
    - The list does not have regulatory authority, but is intended to aid in land management decisions and increase public awareness of invasive species

3) Approach/background (Mincy Moffett, Karan Rawlins)

- Includes ALL non-natives in GA natural areas
- Not concerned with noxious list—'already established as a problem' (K. Rawlins); left to regulatory authority, this list is not concerned with anything but natural or conservation management areas.
- 'Distribution documentation sparse; will include as becomes available'
- Relies on expert opinion: committee researched, board vote-approved
- 2012: In process of revision
    - Summer 2012: distributing to 'committee' of practitioners statewide: scientists, academia, mgmt. professionals
    - Not familiar with Cal-EPPC's criteria approach or publication; expressed interest, but no commitment at this time (Mincy Moffett, pers. comm.)
    - Two-part: 1) revised categorical list (using current definitions), 2) 'do not plant' list for homeowners; alternative native substitutes provided
    - How much will EDDMapS inform the decision process?

Kentucky Exotic Pest Plant Council (KY-EPPC)

1) List structure (Beverly James, Joyce Bender)

- Previously, criteria and categories follow TN-EPPC (for current list):
    - Category 1: severe threat
        - Spread easily into natural areas and displace native vegetation…are, or could become widespread in KY
    - Category 2: significant threat
        - Less impact than category 1…spread from disturbed corridors or sites
    - Category 3: lesser threat
        - Principally spread through and remain in disturbance corridors, not readily invading natural areas; also some agronomic weeds.
- No other attributes
- No reference to sub-state regions or provinces

2) List purpose

- No explicit purpose written for list; Purpose of KY-EPPC (website):

  KY-EPPC was established in 2000 as a non-profit organization. KY-EPPC is a state chapter of SE-EPPC whose purpose is:

  - To raise awareness and promote public understanding regarding the threat posed by invasive exotic pest plants to native plant communities in Kentucky.
  - To facilitate the exchange of information concerning the management and control of invasive exotic pest plants through support of research and monitoring.
  - To serve as an educational, advisory and technical support resource on exotics in Kentucky.
  - To initiate actions to protect Kentucky from the introduction, establishment and spread of invasive exotics.
  - To provide a forum for all interested parties to participate in meetings, workshops, and on a rotational basis with other chapters, host a symposium for the SE EPPC to share the benefits from the information provided by SE EPPC and other recognized experts.

- No regulatory authority

3) Approach/Background

- Relies on expert opinion
  - 'List of known invasives to botany professors, land managers, botanists, weed experts, naturalists, etc. to rank and add additional species and provide rationale…evaluated comments, made master list, tabulated 1-2-3's…another round in 2004….' (Beverly James, Joyce Bender)

- 2012: Updating, sent to same types as previously (B. James)

- Adapting protocol and criteria from VA DCR:
  - "…This provides a more rigorous system of ranking based on impact, biology and ecology, distribution, and difficulty of control, resulting in a more validated list. For every plant on the list, you will be asked to rank each criteria high, medium, low, or insignificant and list the locations in the state you have observed them."
  - Attributes species as hi/med/lo/insignificant in 4 criteria categories
  - Also attributes species with region-of-reporting (10 regions, multiple values possible)

- No relationship to noxious weed list…yet…but some species in common (B. James)

Mississippi Exotic Pest Plant Council (MS-EPPC)

1) List structure

- Criteria based—adapted from TN-EPPC & ALIPC (4 categories [hi-low]: 1, 2, 3, watch list)

- Category 1 criteria:
  - Non-native
  - High potential for establishment in natural communities
  - Impacts biodiversity, ecosystem. functions, or crop productivity
  - Free-living populations
  - Widespread (≥ 3 of 10 physiographic regions of MS)
  - Dense stands, and frequent infestations

- Category 2 criteria:
  - 1-4 of cat. 1
  - In 1 or more CULTURAL uses and >1 physiographic region
  - Not in frequent dense stands

- Category 3 criteria:
  - 1-3 of cat. 1
  - Only recently established free-living populations, or unknown status in MS but bad in adjacent states

- Watch list criteria:
  - 1-3 of cat. 1
  - Cultivated, not free-living populations
  - Known history of invasiveness elsewhere

- Species also attributed with risk ranking, 0-3, in categories of NatureServe 2004 (with the addition of economic impact rating):
  - Ecological impact
  - Current distribution and abundance

- Trend in distribution and abundance
- Management difficulty
- Economic impact of control

- Other attributes: physiognomy, land use/habitat categories, Federal and State (MS) noxious list presence, rankings in TN, AR, AL, FL, GA, and presence on USGS-NAS list

2) List purpose

- Provide 'invasion risk' for each species
  - Ability to degrade natural habitat
  - Economic impacts on agriculture
  - Economic impacts on horticulture industry
  - Economic impacts on turf management
- Educational tool for agencies, water/watershed managers, private landowners, for mgmt. decisions
- No regulatory authority

3) Approach/background (criteria-based)

- MS-EPPC, regional botanists, other stakeholders involved in listing (Gary Ervin, pers. comm.)
  - Presentations and solicitations for list suggestions 2008, and again in spring 2010: entire MS-EPPC membership included, with land managers, biologists, etc., a 'good cross-section of potential stakeholders' (paraphrasing G. Ervin)
  - List and instructions for review provided online via MS-EPPC site and IPAMS site (IPAMS is a Mississippi State University invasive plant research program)
  - Low response both times
- History very similar to ALIPC's list development, but without stakeholder contentions; largely the responsibility of G. Ervin, with input from 10 additional contributors, and comments at MS state EPPC meeting
- List unfinished (species information and/or response is incomplete)
- Attributes are thorough and comprehensive (focus on use as educational tool); but makes completion more difficult and time-consuming (G. Ervin, pers. comm.)

- No pushback from potential adversaries as yet

North Carolina Exotic Pest Plant Council (NC-EPPC)

1) List structure

- NC-DOT list used by NC-EPPC (Johnny Randall)
- 3 categories: threat, moderate threat, watch list
- Category 1: Threat to habitat and natural areas
    - Species are known to be invasive and to degrade habitat.
- Category 2: Moderate threat to habitat and natural areas
    - Species do not, at present, appear to be as significant of a problem in natural areas
- Category 3: Watch List
    - Species that have caused problems in neighboring states, are currently found only in localized areas but should be watched for expansion in range, and/or are state-listed noxious weeds
- NC-DOT (unpublished, 2008) handbook that provides details on biology, habitat, history, chemical management recommendations (see the following site for the handbook: https://connect.ncdot.gov/resources/Environmental/Documents/Invasive%20Exotic%20Plants%20of%20North%20Carolina.pdf)
    - The handbook groups species by category, then by "tree/shrub/herb/vine/aquatic" class
- NC-EPPC website groups first by eco-region and land use/cover type
- Also attributes each species with presence on NC Dept. of Agriculture & Consumer Services 'noxious weeds' list
- No regulatory authority

2) List purpose

- "The primary purpose of this guide is to provide technical information regarding the identification of those plants that pose the most threat to wildlife habitat and natural areas, habitats most susceptible to invasion, and methods to control or eradicate these plants." (NC-DOT handbook)

- Wanted to create a list and guide for managers of natural areas, foremost (Cherri Smith pers. comm.)

3) Approach/Background (Cherri Smith, Johnny Randall pers. comm.)

- Started with C. Smith's personal experience as land manager sent to peers for review; added some species based on recommendations, vetted through other reviewers; same process for categorical definitions

- Native Plant Society list overlaps, but does not entirely coincide—C. Smith 'wanted a priority list specifically for land managers in NC.'

- Some collaboration with NC-EPPC; mostly support from NC-DOT (employer)

    - DOT biologists very onboard with listing spp.

    - DOT roadside engineers very helpful with chemical management; concern over restrictions when natives not readily available (points to the need for research and development, again)

- Not by committee

- No reaction from horticulture industry

- 2012: C. Smith is considering updates/revisions, but no concrete plans

South Carolina Exotic Pest Plant Council (SC-EPPC)

1) List structure

- Species grouped by physiognomic class tree/shrub/vine/grass-sedges/'herbs'; then by threat category (of which there are 4: Severe, Significant, Emerging, and Alert)

- Base Criteria

    1. Established outside of cultivation and non-native to some portion of the region of North America
    2. Potential for rapid growth, high seed or propagule production and dispersal, and establishment in natural communities of North America or in managed areas where it is not desired or the species persists in free living infestations within SC
    3. Occurs in SC
    4. Known to out-compete other species in native plant communities within SC

- Category 1: Severe

    - Meets base criteria 1 & 2 and is listed as a noxious weed in SC or by the federal government and has not been eradicated from known locations in SC

    - Meets criteria 1-4 and occurs in at least 13 counties, presents substantial management difficulties

- Category 2: Significant
  - The species meets base criteria 1-4 and meets either of these:
    - Occurs within at least 13 counties SC and management does not present substantial difficulties
    - Occurs in 4-12 counties within SC and presents substantial management difficulties
- Category 3: Emerging
  - Meets criteria 1 through 4 and…
  - Occurs in 4-12 counties within SC and does not present substantial management difficulties
- Category 4: Alert
  - Meets criteria 1&2 and shows invasiveness in similar habitats to those found in SC, or…
  - 1-3 and shows invasiveness in similar habitats to those found in SC, or…
  - Meets criteria 1-4, occurs in fewer than 4 counties and is considered a severe threat in adjacent states or poses substantial management difficulties, or…
  - Meets criteria 1& 2, but has been eradicated from known locations in SC; monitoring ongoing at known locations
- Species attributed with: eco-region(s) of presence; federal, SC, and other state's noxious list presence; FICMNEW's EDRR species list presence; and EDDMapS distribution-map link

2) List purpose (listed in list brochure):

- Focus attention on the presence and adverse effects exotic invasive plants have on South Carolina's biodiversity, natural communities, native plant and animal habitats, and rare species
- Rank exotic plants based on their invasive characteristics and observed distribution
- Foster early detection of invasive exotics so that control efforts can be implemented rapidly
- Aid resource managers and agencies in decisions about land management efforts toward controlling invasive exotic plants
- Increase public awareness of invasive exotic plant species in an effort to eliminate the use of invasive exotics in landscaping, restoration, and enhancement projects

- Also distinction made between this list (terrestrial) and the work of the Aquatic Invasive Species Taskforce (SC Dept. of Natural Resources)

- No regulatory authority

3) Approach/Background

- Original list in 2004 (Dr. Larry Nelson, Clemson, and SCEPPC list committee), review by expert opinion, consensus approach; reviewed/updated in 2008

- 2011: reviewed similarly but with addition of ranking criteria

- Criteria adopted from TNEPPC (MA, CT, CA, VA, NatureServe also referenced)

- List committee responsible for implementing recommendations (recommendations and suggestions saved between list updates)

- Sent list to practitioners to review and rank, in 3 eco-regions: mountains/piedmont/coast (some species sent to reviewers in adjacent states, where SC info was lacking)

- EDDMapS and SC Plant Atlas (USC Moore Herbarium) maps used to provide distribution info

- 'Alert' replaces watch A & B lists for EDRR work

- 'Emerging' is for species where management difficulty is unclear, or if species is widespread AND management is easy

Tennessee Exotic Pest Plant Council (TN-EPPC)

1) List structure

- 4 categories: severe, significant, lesser, alert

- Category 1: Severe
    - Possess invasive characteristics
    - Spread easily in native plant communities and displace native vegetation

- Category 2: Significant
    - Possess invasive characteristics
    - Not presently considered to spread as easily into native plant communities as severe threat

- Category 3: Emerging

- Spread in or near disturbed areas
- Not presently considered a threat to native plant communities

- Category 4: Alert
  - Possess invasive characteristics
  - Known to be invasive in similar habitats as those found in Tennessee

2) List purpose

- Rank exotics based on their invasive characteristics;
- Foster early detection of invasive exotics enabling resource managers to implement a rapid response action to prevent establishment and spread
- Educate the general public and resource managers in an effort to eliminate the use of invasive exotics in landscaping, restoration, and enhancement projects
- No regulatory authority

3) Approach/Background

- First list developed in 1995, from Wofford and Kral TN Atlas 1993; revised in 2001, 2009, and 2011
- Relied on expert opinion in '95 and '01; added criteria in '09 (adapting MA, VA, CT, CA, NatureServe protocols)
- Reviewed by botanists, ecologists, managers from the '3 grand divisions' of TN
- 2009: Added Alert category (species that need more information)
- 2009: EDDMapS provides distribution information for decision-making

CONDENSED TABLE OF SE-EPPC CHAPTER PLANT LISTING METHODOLOGIES

The following table provides a more condensed explanation and comparison of the different processes and methodologies utilized by the different state chapters in SE-EPPC. As mentioned previously, the table was intended to be published on the SE-EPPC website to serve as a quick reference guide to parties interested in plant listing procedures. See *Figure 2* below.

STATE	LIST STRUCTURE	LIST PURPOSE	APPROACH

Alabama	• Species attributed with multiple characters: o Ornamental or crop, o category 1, 2 or W • Species initially grouped by physiognomic class • Each species attributed with regard to 8 land/water- use categories • AL EPPC website: http://www.se-eppc.org/alabama/ • Contact person (2012) Nancy J. Loewenstein Phone: 334-844-1061 Email: loewenj@auburn.edu	• Rank invasive species • Foster EDRR • Educate and limit use of invasive spp.	• Category 1: widespread, dense infestations occurring in two or more regions of the state • Category 2: scattered/localized infestations in AL • Watch categories o A: recent free-living populations, or invasive in nearby states and status unclear in AL o B: plant cultivated in AL and history of invasiveness elsewhere • Based on expert opinion, criteria (modeled after TN-EPPC & MA 2005 report) and committee research • Board approved • No regulatory authority
Florida	• All species are assigned to Category 1 or 2 • Ssp. attributed with regulatory classification & region of incidence • Regulatory: Prohibited aquatic (FL Dept. Ag. Consumer Serv.), and/or Noxious weed (FDACS), and/or Noxious weed (USDA) • Region: Northern and/or Central and/or South (roughly = USDA growing regions) • FL EPPC website: http://www.fleppc.org/ • List contact person (2012): Pat Howell Email: PHOWELL@broward.org	• To focus attention on: • Adverse effects on FL biodiversity & plant communities • Habitat losses from exotic infestations • Effects on endangered spp. • Need to prevent habitat loss thru pest plant mgmt. • Socio-economic	• Category 1: Altering native plant community through displacement, changing structures/functions, hybridizing/natives ▪ Does not rely on geological range or economic impact • Category 2: increased abundance or frequency, not as bad as category 1 • Relies on expert opinion • Supported by mapping and database records • Updated every 2 yrs

		impacts of pest plants • Changes in seriousness over time • Provide info to help managers	• FLEPPC sponsors a liaison committee • Not regulatory, but encourage use of list to support regulations
Georgia	• 4 categories +1 subcategory, hi-low (1,2,3,4 plus Alert [1A]) • No reference to regional variation (eco, phys., etc.), in decision-making or species-list attribution • GA EPPC website: http://www.gaeppc.org/ • List contact person (2012): Mincy Moffett Phone: (706) 548-8675 Email:mincy.moffett@dnr.state.ga.us	• Identify and categorize plants that pose threats to natural areas in Georgia • Aid in land management decisions and increase public awareness of invasive species	• Category 1: Extensively invading GA natural areas plant comm. and displacing native spp. • Category 1, Alert: not yet, but significant potential to become serious problem • Category 2: Moderate problem, lesser than Category 1 • Category 3: Minor GA problem, or unknown in GA but problem in adjacent states • Category 4: Exotic, but not problem in GA nat. areas; or species needs more info/documentation • Relies on expert opinion, committee researched, board approved • No regulatory authority List is focused on natural areas & conservation mgmt. areas
Kentucky	• Criteria and categories follow TNEPPC, Hi-Low (1,2,3) • No reference to sub-state regions or eco-, phys.-, etc., provinces • KY EPPC website: http://www.se-eppc.org/ky/ • List contact person (2012): Beverly James	o Raise awareness & promote public understanding o Facilitate the exchange of information concerning management &	• Category 1: Severe threat o Spread easily into natural areas & displace native veg., are/could become widespread in KY

	Phone: 859-351-7770 Email: floracliff@aol.com	control o Serve as an educational, advisory and technical support resource on exotics in KY o Initiate actions to protect KY from invasive exotics o Provide a forum for all interested parties to participate	• Category 2: Significant threat o Less impact than cat. 1, spread from disturbance corridors or sites • Category 3: Lesser threat o Principally spread through and remain in disturbance corridors, not readily invading natural areas; also some agronomic weeds • No regulatory authority • Utilize expert opinion for creation of list: Send to experts to rank, add species, and provide rationale • 2012: Adapting protocol and criteria from VA DCR
Mississippi	• 4 categories (hi-low): 1, 2, 3, watch list • Criteria based (adapted from TNEPPC & ALIPC) • Species also attributed with risk ranking, 0-3, in 5 categories of Natureserve (with the addition of economic impact rating) • Other attributes: physiognomy, land use categories, federal and MS noxious list presence, and rankings in TN, AR, AL, FL, GA, and presence on USGS-NAS list • NC EPPC website: http://www.se-eppc.org/mississippi/ • List contact person (2012): Dr. Gary N. Ervin Phone: (662) 325-1203 Email: gervin@biology.msstate.edu	• Provide 'invasion risk' for each spp. based on: o ability to degrade natural habitat o economic impacts (agriculture) o economic impacts (horticulture) o economic impacts (turf mgmt) • Educational tool for agencies, water/watershed mgr.s, private landowners	• Category 1: o Non-native o High potential for establishment in natural communities o Impacts on biodiversity, ecosystem functions, crop productivity o Free-living populations o Widespread (>= 3 of 10 physiographic regions of MS) o Dense stands and frequent infestations • Category 2: o 1-4 of cat. 1

			○ In 1 or more CULTURAL uses and >1 physiographic region ○ Not in frequent dense stands • Category 3: ○ 1-3 of cat. 1 ○ Only recently established populations or unknown status in MS but bad in adjacent states • Watch List: ○ 1-3 of cat. 1 ○ Cultivated, not free-living populations ○ Known history of invasiveness elsewhere • Species also attributed with risk ranking 0-3 in categories of Natureserve 2004 ○ Ecological impact ○ Current distribution ○ Trend in distribution and abundance ○ Mgmt. difficulty ○ Price of control • MS-EPPC, regional botanists, other stakeholders involved in listing species • No regulatory authority
North Carolina	• 3 categories: threat, moderate threat, watch list • NC-DOT list used by NCEPPC • NC-DOT handbook provides details on biology, habitat, history, chemical mgmt. recommendations • Handbook groups ssp. by category, then by class	• Provide technical information regarding the identification of plants posing the greatest threats to wildlife habitat and natural areas,	• Category 1: Threat to habitat and natural areas ○ Species in the threat section are known to be invasive and to degrade habitat.

	• NC-EPPC website groups by ecoregion and landuse/cover type, then by phys./habitat class • Attributes each ssp. with presence on NC Dept. of Ag 'noxious weeds' list • NC EPPC website: http://nceppc.weebly.com/ • List contact person (2012): Johnny Randall Phone: (919) 962-0522 Email: jrandall@email.unc.edu	habitats most susceptible to invasion, and methods to control or eradicate these plants • Guide for managers of natural areas	• Category 2: Moderate threat to habitat and natural areas o Species listed as a moderate threat do not, at present, appear to be as significant of a problem in natural areas • Category 3: Watch list o Species that have caused problems in neighboring states, are currently found in localized areas but should be watched for expansion in range, and/or are state-listed noxious weeds • List started with land manager's personal experience, sent to peers for review, added some species. based on recommendations, vetted thru other reviewers • Some collaboration with NC-EPPC; mostly have support from NCDOT • 2012: Considering updates/revisions, but no definite plans • No regulatory authority
South Carolina	• 4 categories (above base attributes): severe, significant, emerging, alert • Base Attributes/Criteria 1. Established outside of cultivation and non-native to some portion of the region of North America 2. Potential for rapid growth, high seed or propagule production and	• Distinction between terrestrial list and the work of the Aquatic Invasive Species Taskforce	• Category 1: Severe threat o Meets base criteria 1& 2 and listed as noxious weed in SC or by the federal gov. & has not been

	dispersal, and establishment in natural communities of North America or in managed areas where it is not desired or the species persists in free living infestations within SC 3. Occurs in SC 4. Known to out-compete other species in native plant communities within SC • Species grouped by physiognomic class (tree/shrub/vine/grass-sedges/'herbs') then by threat category • Species attributed with: eco-region(s) of presence; federal, SC, and other state's noxious list presence; FICMNEW's EDRR spp. list presence; and EDDMapS distribution-map link • SC EPPC website: http://www.se-eppc.org/southcarolina/ • List contact person (2012): Sudie Daves Thomas Phone: (803) 874-3337 ext.104 Email: sudie.thomas@sc.usda.gov	eradicated from known locations o Meets criteria 1-4 and occurs in at least 13 counties, presents substantial mang. difficulties • Category 2: Significant o The species meets base criteria 1-4 & meets either of these: o Occurs within at least 13 counties SC & mang. does not present substantial difficulties o Occurs in 4-12 counties within SC & presents substantial mang. difficulties • Category 3: Emerging o Meets criteria 1 through 4 and… o Occurs in 4-12 counties within SC & does not present substantial mang. difficulties • Category 4: Alert o Meets criteria 1&2 & shows invasiveness in similar habitats to those found in SC, or… o 1-3 and shows invasiveness in similar habitats to those found in SC, or… o Meets criteria 1-4, occurs in fewer than 4 counties & is considered severe threat in adjacent states or poses substantial

			mang. difficulties o Meets criteria 1& 2, but has been eradicated from known locations in SC; monitoring ongoing • Original list created 2004 (Dr. Nelson & SC-EPPC list committee), review by expert opinion, consensus approach • Reviewed & added ranking criteria (2011) adopted from TNEPPC (MA, CT, CA, VA, Natureserve) • List committee • Send list to practitioners to review &rank in 3 eco-regions: mountains, piedmont, coast • EDDMapS and SC Plant Atlas maps used for distribution info • 2011: 'Alert' replaces watch A &B lists • 2011: 'Emerging' designated • Non-regulatory
Tennessee	• 4 categories: severe, significant, lesser, alert • TN EPPC website: http://www.tneppc.org/invasive_plants • List contact person (2012): Marie JJK Tackett Phone: 423-569-2404 ext. 251 Email: marie.tackett@nps.gov	• Rank exotics based on invasive characteristic • Foster early detection to enable rapid response • Educate the public & resource managers	• Category 1: Severe o Possess invasive characteristics o Spread easily in native plant communities & displace native vegetation • Category 2: Significant o Possess invasive characteristics o Not presently considered to spread as easily into native plant communities as

Severe Threat
- Category 3: Emerging
  - Spread in or near disturbed areas
  - Not presently considered a threat to native plant communities
- Category 4: Alert
  - Possess invasive characteristics
  - Known to be invasive in similar habitats as those found in Tennessee
- First list developed in 1995
- Relied on expert opinion to devise list
- List revised in 2001, 2009, 2011
- Added criteria in 2009 (adapting MA, VA, CT, CA, Nature-serve)
- Reviewed by botanists, ecologists, land managers from '3 grand divisions' of TN (2009)
- TN-EPPC protocol evaluates species based on observations
- Each plant put through standardized ranking criteria
- Added Alert category (2009)
- Tennessee Invasive Plant Species (TIPS) Steering Committee created to focus on "watch list" (2009)
- EDDMapS provides distribution info
- No regulatory authority

Figure 2: Condensed Table of SE-EPPC Chapter Invasive Plant Listing Methodologies

DISCUSSION AND RECOMMENDATIONS

LIST PURPOSE

It should be common procedure to carefully develop and explicitly state a purpose for each chapter's list. The goal statement, "Purpose" guides the list structure, development, and use, and may help defuse adversaries and misconceptions. To proceed with developing, prioritizing, and updating lists, there must be a shared understanding of the purpose the list will serve. It is possible, however, to agree upon a working purpose that drives the process of listing. Some state chapters have not committed the purpose of their list to written form, or have not publicized it along with their list of invasive species. Without an explicit list purpose, even supportive stakeholders' tacit understandings may be different. The process will lack consistent guidance. Further, when a list moves from internal EPPC review into the public eye, as it is put to use, the statement of purpose provides a much more informative document. Experience has shown that not just the details, but the mere existence, of these lists can be quickly misinterpreted by the public. Clear purpose, attached directly to the list, may help minimize hard reactions. Concrete wording also bolsters list usefulness as a tool, and provides more opportunity for inclusion of interested parties.

Where purpose statements are currently included with chapters' lists, they consistently emphasize education, management guidance, and a non-regulatory nature throughout the region. In addition, a companion-document, clearly showing a decision-tree, flowchart, and/or criteria for species lists for each state, has become common (though not ubiquitous). This underscores the importance of explicit criteria (also becoming commonplace). Transparency and defensibility of the listing process follow. It is highly recommended, therefore, that all chapters use these experiences to provide, with their lists:

1) A clear statement of purpose, to include
    a) Education, management, and non-regulation, along with
    b) A publicized ranking protocol that promotes public understanding and list objectivity.

LIST STRUCTURE

List structure varies necessarily from state to state. Each chapter approaches the details of its list as their immediate and foreseeable needs require. In no way should that flexibility be abridged. With that understanding, the following section provides detailed recommendations gathered

from observations of all SE-EPPC chapters' lists, which are seen to work well in their respective contexts. The shared experience may benefit all chapters, and the parent EPPC, if adopted. Some consistency in list structure across the southeast will support a broader scale approach to common problems, while chapters' ability to effectively address their unique issues remains paramount.

Attributes, organized into fields or columns in each state's list, comprise most of the information content. Though each state's needs may be different, the following recommendations will be consistently useful. Probably, in recognition of the likely eventual digitization of list functions and analysis, all attributes of species should be organized as explicit columns in the lists. As an illustration, some states group species by category/threat level for publication; in lieu of, or in addition to, hardcopy list distribution, support for public consumption of a more analytic database or spreadsheet format may increase even general list use. A database format encourages interaction, and basic query capabilities will move the product from static lists (which are difficult to envision in any format other than that in which they are presented) to user-specific tools that can dramatically advance management and effect on invasive species in specific locations.

The following have been compiled from the list methods and experiences of all chapters of SE-EPPC. Most lists contain a select set, and some lists are recently or currently being revised and include more of these suggestions.

1. Category (severity of threat)

Many styles of providing threat information exist. Basic recommendations can be made, but this seems best left to each state chapter to determine. A general caveat regards the number and type of categories: beware of diluting list efficacy with excessive categorical divisions. The *de facto* consensus among state chapters appears to be that 2 or 3 categories of known species' impact works well. A separate unique category addresses species whose impacts are uncertain or incomplete (i.e., "Alert" or "Watch" classes). For lists that subdivide further, some revision and reclassification into fewer threat-levels may increase the perceived weight of those threats. More similar categorical systems among chapters will also help leverage each list's utility for a broader geography. As an attribute within a given state EPPC list, the addition of neighboring states' list status, noted below, will provide a crosswalk between states and help move toward

consistency across the region (which is already significant, with the adoption of criteria-based assessments, primarily adapted from the same group of literature). State chapters, of course, will be the ultimate arbiters of what works best for their own purposes.

2. Species' physiognomy, land- and cultural-use significance, and/or general habitat descriptor
Growth habit has obvious implications for search and treatment efforts, as do any notable habitat preferences. Although some chapters have conscientiously excluded taxa that are associated with intensive land use, other cultural associations (less intensive than, for example, agriculture) may be worth noting for complete attribution. There are, of course, species with anthropogenic origins other than agriculture that are now encroaching on natural areas as escapes. Other species are problems for natural areas precisely because of continued cultural support. Where such taxa have been categorically excluded from list efforts, the list purpose may need review and expansion. Unduly restricting these species and attributes from the list will risk missing culture-nature interplays, and other problems that could inhibit use for conservation action and educational purposes. Including these characters not only aids land managers, it may also help publicize problems in a novel or more intuitive light for the general public.

3. Eco-region, physiographic, or climatic province where species occur
Most chapters consider regional differences in their decision-making, but it should also be noted in the final list (for examples see the lists of ALIPC, and TNEPPC). At least one of these sub-state delimits would be useful, should have its own field/column, and should be recommended for all state chapters.

4. Regulatory status of species: federal (if any), home state, and neighboring states
An example of this kind of attribution may be seen in the MS-EPPC list (2010). Additionally, reporting species' rankings by neighboring state EPPC chapters will foment regional perspectives, and would be particularly useful for early detection/rapid response work.

In addition to the foregoing, further details are recommended below, as added functionality in a digital context. They may not lend themselves to typical column-attribute structure, and almost certainly will not be accommodated by standard hardcopy lists.

5. Distribution maps directly accessible as links to EDDMapS.

The South Carolina EPPC's recently revised spreadsheet-style list provides an effective illustration.

6. Risk assessment protocol outlines

Incorporating risk assessment directly into chapters' lists may aid early detection/rapid response efforts directed toward species in Alert or Watch categories. The Florida IFAS protocol may serve as a model, but is very thorough and time-consuming. It may be modified and scaled down for quicker application and state EPPC needs. MS-EPPC also solicits methodical evaluations of risk for its listed species (G. Ervin, pers. comm.); other chapters may find such effort useful as well.

7. Management recommendations for species

As an example, the NC-DOT and NC-EPPC list presents management recommendations. In a digital interactive format, links could be incorporated into the standard tabular list, directing users to, for instance, The Nature Conservancy's Element Abstracts, and state and regional EPPC management guideline documents.

8. Criteria worksheets

Worksheets may be increasingly used by EPPC organizations (see Heffernan et al. 2001 and Cal-EPPC 2003 for examples); accessible documentation for each species, or for select examples, would logically follow. Worksheets may be housed within the working database along with tables of species and attributes, if chapters document their listing process with this degree of formality. This level of transparency and defensibility may, however, be excessive for most purposes at this time. See the sample criteria document in Appendix B (MS-EPPC Criteria).

SURVEY RESULTS: CHAPTER INVASIVE PLANT LISTING METHODOLOGIES

The survey respondents were asked their opinion regarding whether or not increased consistency among states' invasive plant listing methodologies (e.g., whether an invasive plant is considered a high, medium, or low risk) would be an improvement. Of the 164 who answered the question, a strong majority reported that they thought states' should have increased consistency in listing methodologies (57%, n=93), followed by 37% believing that "maybe" it would be good (n=61) and only 6% (n=10) indicated that it would not be an improvement.

As a follow up question, respondents were asked to write in the pros and cons of increased consistency among states' invasive plant listing procedures and criteria. Fifty-four respondents wrote in "all pros" about increased consistency. Those in favor most commonly indicated that consistency was positive, it provided a more defensible list, and raised awareness. Examples include:

- ✓ *No cons to consistency with a variety of groups with the same goals.*
- ✓ *Until a consistent method is developed, there will never the control of invasives that is needed.*

Forty respondents wrote in both pros and cons to increased consistency, and while the pros were much like those previously mentioned, the cons included the different conditions associated with different states, economic impacts, and the additional work required to make the methodologies more similar. An additional 25 respondents wrote in only cons, and were not in favor of increased consistency for (mostly) for reasons such as:

- ✓ *The seriousness of any invasive depends on the environment (of state) into which it is introduced, so the impact of any species will vary.*
- ✓ *Sometimes, there are specific reasons to do things a little different on a state-by-state basis.*

Respondents were asked if they thought that the invasive plant listing process was controversial in their state. While many who are interested in the issue and on the ListServe may not be very "active" on the board or with listing procedures, the board thought it would be interesting to measure perceptions of controversial listings. Given that the highest responses was "do not know" (47.5%, n=77), it is clear that most of those represented are not active or knowledgeable in the listing process. This was followed by 27% who indicated that there had been listing controversy (n=44) and 25% who thought that there had not been controversies (n=41). These respondents were also asked to write in any particular species that they knew of that had been controversial. Many wrote in "no," but several wrote about popular or useful species in general (e.g. nursery, horticulture, agricultural, soil stabilization, etc.). From there, 28 respondents wrote in specific species, but only one species, *Nandina*, came up more than a couple times.

Respondents were asked how their state/chapter decided what taxa/species were a priority in the listing process. Of the 98 that wrote in a response, 35 reported a defined scientific methodology or process or the level of invasiveness of the plant. Some of these responses included:

- ✓ *Severity of invasiveness, early detection of plants that have exhibited invasiveness in neighboring states.*

- ✓ *Invasiveness and degree of potential environmental damage possible. Available resources also play a role in prioritization.*

Twenty-five respondents wrote in that they did not know how these things were reported. An additional 20 respondents wrote in that a committee, panel of experts, or consensus was involved in determining listing priorities and status.

- ✓ *Input from a council of professionals from a variety of backgrounds.*

- ✓ *Board of directors makes suggestions based professional experience and the board compiles and periodically updates the list.*

Others made various comments about different topics (n=13), control-related priority areas (n=5), or a focus on public parks (n=3).

Respondents were asked if, to the best of their knowledge, their state chapter experienced good participation in listing activities. A strong majority of 59% (n=92) indicated that they did not know, followed by 33% believing that they did have good participation (n=52) and 8% that their state chapter did not have good participation in listing activities (n=13).

GENERAL OBSERVATIONS AND LESSONS LEARNED

When lists are published as hardcopy or static digital documents, a number of groupings are intuitive and useful (e.g., by category of threat, and/or by physiognomy, and/or by eco-region), but not all are useful in all imaginable situations. Any grouping method will necessarily exclude some other types of search and use. For example, grouping species by physiographic region provides useful spatial generalizations, but is not as well suited to ascertaining a particular species' distribution throughout all regions in a state. Each chapter reserves the ability to make choices regarding its publication style; at the least, the format should be directly based on an explicitly stated List Purpose.

As mentioned above, digital database format would be far superior for analytic purposes. Users could then create functional groups on-the-fly, in ways that best serve their own analytic purpose. This format better supports GIS integration and the management-tool purpose of each list. Potential educational utility would also be greatly enhanced. EDDMapS currently provides distribution data, and supports outside links to attribute sources (C. Bargeron, pers. comm.). The system has the capability to house, in the near future, both spatial and comprehensive attribute data for species (including state EPPC's list attributes), internally. In this way it can be a fully integrated GIS. EDDMapS is commonly cited as a source for state listing distributional support, and will increasingly be used, especially as geographic ranges and habitat proclivities are attributed in EPPC lists. Again, the more EDDMapS can offer within its virtual walls, in comprehensive and robust GIS utility for analysis, the wider its audience. Greater end-utility will certainly garner greater contributor input, as well.

More documentation and information is good, but comes at a cost of both time and funding, and possibly efficacy. MS-EPPC's list is very thoroughly attributed with most fields recommended above, but has yet to complete the review of its list of species due to the information-load required, a dearth of feedback, and conflicting workload priorities (G. Ervin, pers. comm.). Similarly, criteria-based decision methods that require too much information for verification will bog down in preparation. Though an illustrative example in many respects and suitable to their context, the VA DCR's protocols, had the benefit of state funding, mission directive, and a suite of only eleven species to evaluate. Risk assessment, as well, should be an ongoing analysis that complements and enhances a species' inclusion on state lists. The assessment is designed and implemented accordingly in both the IFAS and MS-EPPC processes, and should be adapted with this in mind, specifically for 'Alert' or 'Watch-list' species. Striking the balance between appropriate deliberation and excessive analysis should be the objective when considering: 1) qualifications for listing and primary categorization and 2) the eventuality of species' complete attribution.

State chapters are encouraged to review and update lists on a 2-4 year cycle. FL-EPPC has been successful at revisiting its list every two years. Circumstances vary widely, and for other chapters even four-year cycles may be difficult. It would be unwise to leave a list fallow for longer, however; many things can change in the context of species, attributes, and emerging information

in short time spans. Partial-list, or 'spot'/as-needed updates are a potential solution for ensuring continued list timeliness.

List committees, rather than individual efforts, are also helpful and may be necessary in sharing workload and responsibility. The trade-off in committee wrangling, and any associated board-of-directors vote or involvement in approving lists, is sometimes a problem; but completion and updating have been shown to be very difficult when only one person shoulders the majority of the load. Working with a committee in some form is a recommendation for future list work.

As an alternative or complementary prescription, dedicated and funded staff is ideal. Grant funding, academic stipends, or any money that requires institutional support, will corroborate the importance of listing work as a budget priority. Most listing efforts suffer from conflicting workload issues. While volunteerism is the typical mode of EPPC organization, funding designates priority. As some examples, the research world may be interested in studies that involve listing review, analysis, or structural enhancements in list database design. The academic, agency, and industry communities will steer research and funding as each understands the issue to be a budgetary priority. State and regional EPPCs will contribute greatly to such an understanding. The Councils' most fundamental job is in clarifying what can be a convoluted problem, which is often difficult to grasp conceptually and still more difficult to monetize. This duty is what drives the idea of invasive species lists. It informs the development, maintenance, and application of the lists. Listing, and all peripherally related efforts, are subject to the same economic realities as other work. It would be best served by some kind of financial commitment.

Clarity of purpose and commitment will also come with a cost beyond money. The potential for adversaries increases as lists become more publicized, recognized as authoritative documents, and are used in advocating for or against planting certain species. Experiences vary along a recognizable continuum, although it is not always predictable. MS-EPPC, at the low-controversy end, has had trouble getting interested response in developing its list; while the Virginia DCR, at the other end, has had to defend its regulatory decisions against potential litigation. Note, though, that confrontation may exist regardless of the lists regulatory authority, or lack thereof. Some blowback is to be expected, starting with stakeholders and board/committee members (as seen in ALIPC's experience), through to early-invitees-cum-late-critics (for instance, VA DCR's

challenge from the ASTA). This warrants a special caveat for state chapters that have not yet seen contention regarding their lists. Somewhere in the middle spectrum are organizations such as Cal-EPPC and FL-EPPC. Cal-EPPC has anticipated challenges and adopted a thorough criteria basis for the species it includes on its list. The FL-EPPC approach, more inclined to expert consensus, still does not shy away from promoting its list as guidance for regulation. FL-EPPC's list wording is somewhat more assertive than most of its southeastern counterparts; reasons vary with comparative circumstances. Balancing the printed assertiveness, the Florida chapter maintains a liaison committee with the statewide grower's/nursery interest (FL-EPPC 2003). The liaison provides mollifying value in list negotiations (David Hall pers. comm.).

A relatively simple way to increase chapter listing methodology transparency would be to prepare and make accessible a guideline for interested parties on the listing process. MS-EPPC provides such a document (see Appendix B). It is easy to use, provides the reader with a comprehensive understanding of how species are grouped or listed (e.g. criteria, narrative, etc.). The map of different regions in the state is also a helpful way to depict ways in which states categorize different species.

On another note, efforts to compare plant listing methodology across the southeast EPPC chapters is a big step in the direction of enhancing consistency, ensuring transparency, and moving toward more coordinated southeastern invasive species efforts. In addition to this report, there is another ongoing effort taking place to contrast and compare southeastern state invasive plant lists. The U.S. Forest Service and the University of Georgia's Bugwood Network has partnered on a project to compile (and continuously update) the listing activities of the 13 southern states. The list provides information on each plant species growth form, scientific and common name, and whether or not the species is listed in each state. The list also includes the status of U.S. law/policy and U.S. Forest Service policy and monitoring status per species. While this project is not yet complete, and will require continuous updating it provides the most comprehensive overview of invasive plant lists of the 13 southern states. It can be viewed at http://www.invasive.org/south/seweeds.cfm (Miller, Chambliss & Bargeron, 2004).

PART 2: EDDMapS

A summary of EDDMapS instructions, usage, and recommendations for increased engagement from stakeholders based on survey results

Early Detection and Rapid Response (EDRR) is a cornerstone of conceptual invasive species management at national, state, and local levels. Following Executive Order 13112 (1999), The National Invasive Species Council (NISC) issued the comprehensive National Invasive Species Management Plan (2001). High priority was given to EDRR development, placing it at the top tier of over-arching "Strategic Goals" (NISC, 2008). Drawing from other works in the emerging field (see FICMNEW, 2003 for example), the Council then issued guidelines for establishing EDRR systems (NISC, 2003).

The updated National Invasive Species Management Plan determined, as its EDRR Strategic Goal, to "develop and enhance the capacity to identify, report and effectively respond to newly discovered/localized invasive species" (NISC, 2008). In the southeast U.S., efforts were well underway to answer the call. Responding to a need for regional coordination, The Early Detection and Distribution Mapping System (EDDMapS) was developed for the Southeast Exotic Pest Plant Council (SE-EPPC) beginning in 2005 (Bargeron & Moorhead, 2007). Data contributions to EDDMapS, and its capacity to serve as a monitoring tool, increased rapidly. It is now thoroughly functional, and has been shown to be a robust, user-friendly, and comprehensive mapping database for EDRR.

Much work has been done to make contributing to EDDMapS easy, and the data quality sound. The utility of the output of the system, for decision-making and land management responses, is enhanced by a customizable Alert function, whereby users may opt to receive automated emails when invasives are documented. The comprehensiveness of EDDMapS is limited only by its reach to contributors, including its accessibility.

DATA COLLECTION

Field data should be collected to consist of three things: locational data, photos (or voucher specimen), and attribute data.

Locational data

Location data is, of course, critical to the mapping functions of EDDMapS. The proliferation of recreational-grade GPS receivers has made capturing this data an easy task. Referring to your GPS manual, record the coordinates of the infestation in Latitude/Longitude (preferably decimal degrees), using the North American Datum of 1983 ("NAD83"; or, the World Geodetic Survey of 1984, "WGS84," is an acceptable approximation for the southeastern U.S.).

If ability or preference prohibits using GPS technology and hardware, tools are available within the EDDMapS session for documenting locations using a map interface. EDDMapS also includes tools for converting other coordinate formats (such as Degree-Minute-Second, or Universal Transverse Mercator, "UTM") into decimal degrees, and for calculating Latitude/Longitude Coordinates from street address inputs ("geocoding").

Photographs

Photographs of the infestation will most likely be necessary for verification by the designated state coordinator. Photos should be diagnostic for taxonomic and infestation illustration. Rawlins, et al. (2011) Advise that images "include leaf shape and arrangement, flowers, fruit, roots, and unique features…." Habitat and whole plant images are also helpful, as is a level of photographic quality adequate for identification and verification.

Attribute data

Attributes may be thought of as the non-locational characteristics of the occurrence. EDDMapS specifies each available attribute as "Required," "Recommended," or "Optional," detailed in section 2, items 1-17, below (adapted from TN-EPPC 2008, C. Bargeron, pers. comm. October 16, 2011, and data entry pages at http://www.eddmaps.org/report/). For each record of occurrence entered, completing all attribute information is ideal; at the minimum, all "Required" attributes must be populated. In the field, record data succinctly in a field notebook, or in the customized datasheets for EDDMapS attributes (download at http://www.eddmaps.org/tools/).

DATA ENTRY, EDDMAPS

For transcribing field data, the single-record data entry interface is outlined here. It is designed to assist the user's completion of the form, with appropriate drop-down lists, "Help" icons, and instructional links; see also the EDDMapS: Invasive Plant Mapping Handbook (Rawlins, et al. 2011), available at http://www.eddmaps.org/training/EDDmapS.pdf, for authoritative guidance on data entry details. Bulk or Batch data entry is also available, subject to the same attribution requirements described below for single-record entry. (Bulk-entry spreadsheets and instructions are available for download at http://www.eddmaps.org/tools/; completed forms may be submitted to Rebekah Wallace (bekahwal@uga.edu) for uploading into the EDDMapS database.)

EDDMapS Attributes, data entry interface "Required based on NAWMA standards:"

1) **Pest**: Begin entering common or scientific name; a drop-down menu with a list of plants will appear. If the pest is not listed or is unknown, type and choose "unlisted plant" or "unknown plant" from the list and describe the plant in the comments section below. If unsure of species identification, choose "Unknown."

2) **Observation Date**: Enter the date pest was observed in the format mm/dd/yyyy.

3) **Infested Area**: Enter the area that includes the invasive species only, then choose from the following units: acres, hectares, square feet, square meters.

4) **Gross Area** *("Recommended," not "Required"):* Estimate the general area within which the invasive species is found, then specify areal units. This area may include areas that are not occupied by this species.

5) **Habitat**: From the drop-down menu, choose the description that best describes the habitat within which the invasive plant occurs. If the habitat is not listed, choose "Other." Include a brief habitat description in Comments section, below.

6) **Canopy Closure**: Estimate the area of ground covered by foliage of the invasive species; specify areal units.

7) **Abundance/Density**: Choose the most appropriate answer from the drop-down menu: Single Plant, Scattered Plants, Dense Monoculture, Scattered Dense Patches.

8) **Latitude/Longitude**:

a) Enter as decimal degrees captured with a GPS receiver, in NAD83 or WGS84 datum; calculate decimal degrees using embedded tools, if needed. *OR*

b) Select a location using an online mapping system. First select the county from the dropdown menu, then move the marker on the map to the correct location. The map background may be moved by click -drag. A pinpoint will appear on the map. Zoom into the point by clicking the "+" sign on the upper left hand corner of the map, zoom out by clicking "-". The pinpoint may be click-dragged to the appropriate spot on the map.
Coordinates and other location information will automatically populate in the appropriate boxes.

EDDMapS Attributes, data entry interface "Optional:"

9) **Location Description**: Add any information that would aid in relocating the infestation.
10) **Site Name:** Enter the common or local name of the site, if applicable.
11) **Ownership**: From the drop-down menu, select the ownership type for the property on which the invasive plant was found.
12) **Images**: Although this section is "optional" for submitting the report online, images must be attached for the occurrence to receive verification (if no voucher specimen is collected). Upload up to five images. These should be diagnostic in nature. Select images that show characteristics used to identify the species.
13) **Comments**: Add comments regarding unlisted species, unlisted habitat types, voucher specimen, or any essential information not previously revealed in the data entry form.
14) **Identified by**: Enter name of identifier, if identified by another person.
15) **Voucher Specimen Made**: Select yes or no, accordingly.
16) **Herbarium holding specimen**: Enter the name of the herbarium where the specimen is housed.
17) **Report**: Select "Report." The data will be sent to a state reviewer who will verify the infestation.

To streamline data entry for users and enhance the input process, EDDMapS hired a Data Coordinator last year. Rebekah Wallace was hired on March 7, 2011 as the EDDMapS Data Coordinator for the Center for Invasive Species and Ecosystem Health. Since she was hired, she has entered 923,149 records, of which 888,759 are invasive species records and 6,322 are biocontrol release records. Records have been entered for all 50 of the United States, as well as Puerto Rico, Guam, and 19,922 records for Canada.

Notable databases and datasets that have been incorporated include: What's Invasive, IPAMS, Canada PRIPS, MidAtlantic Early Detection Network, Florida Fish and Wildlife Commission, Iowa DNR, North Dakota Noxious Weeds, USFS FIA (all regions), Idaho Department of Agriculture, AKEPIC, Oregon Dept. of Agriculture, IPANE, USGS NIS Aquatics, SWEMP, Everglades Digital Aerial Sketchmapping, NJISST, and NPS Exotic Plant Management Teams NCR and NE Regions. She is in currently working on projects to share data with: Biota of North America Program, USDA Plants Database, Utah Weed Control Association, CalFlora, and several other groups and organizations. The hiring of the Data Coordinator seems to have improved the frequency and quality of inputs into EDDMapS, as any user who has issues or has data that is not in the exact format requested can easily request her assistance. While SE-EPPC expressed concerns regarding EDDMapS data entry by users who had bulk data or alternative formats, this issue, if it ever was one, seems to have been alleviated with a dedicated staff member who provides assistance and easy access to users.

SURVEY RESULTS: USE & EXPERIENCES OF EDDMapS

Respondents were asked many questions about their use of and experience with EDDMapS. Of the 151 respondents who answered the question, a strong majority of 58% (n=88) reported that they did use EDDMapS. This was followed by 24.5% (n=37) who do not use EDDMapS and an additional 17% (n=26) who "did not know" if they used EDDMapS (which suggests that they do not). The following five questions were answered only by those responded that they used EDDMapS (n=88). When asked how often they used EDDMapS, 41.5% reported that they use it "sometimes," which was followed by "frequently" and "not very often." See *Figure 3* below.

Frequency of Use (EDDMapS) N=82	**Percentage**	**Frequency**
Frequently	34.1%	n=28
Sometimes	41.5%	n=34
Not very often	24.4%	n=20

Figure 3: Frequency of Use of EDDMapS

Board members were interested in exploring reports that some agencies and organizations are now requiring the use of EDDMapS in regular reporting duties. Respondents were asked if their organization required the use of EDDMapS, to which a strong majority (89%, n=74) reported that they are not required to use the resource. Eleven percent (n=9) indicated that they are

required by their organization to utilize EDDMapS for reporting and tracking invasive species infestations. Similarly, respondents were asked if their organization or SE-EPPC chapter participated in the verification process (of new reports to EDDMapS), to which many "did not know" (45%, n=37), 32.4% indicated that they did (n=27), and 23% (n=19) did not.

EDDMapS is a very valuable tool for reporting new occurrences of invasive species and tracking known populations. While many in the field of invasive species management or prevention utilize the resource regularly, not all do (which is also reflected in the survey results). It is important to explore experiences and perceptions of users to ensure ease of use and satisfaction with the resource. Respondents were asked an open-ended question about any issues that they have experienced with EDDMapS. Of the 67 who wrote in a response, 50 of them responded that they had not experienced any issues with the resource. Many of them included comments about how much they appreciated EDDMapS or had an issue that was resolved quickly.

- ✓ *No issues. Exceedingly helpful at this level of mapping.*

- ✓ *No issues—I did find what appeared to me to be erroneous records of Solanum viarum in West Virginia. I contacted the EDDMapS folks, and they corrected it right away.*

Seventeen of the respondents did report an issue. These comments were either general such as *"a few glitches now and then"* or focused on a particular issue such as "*yes, specifically with the iphone app."* There were also comments about issues that had been resolved.

- ✓ *Yes but those issues were in the earlier stages of development and have long been resolved.*

Respondents were asked if they provided follow up information to EDDMapS once they reported and infestation. Commonly, follow up information includes updated information or treatment results. Of the 83 respondents who answered the question, 36% (n=30) did not know if they provided follow up information (which suggests that they probably did not).

Follow up Information to EDDMapS (N=83)	Percentage	Frequency
Do not know	36.1%	n=30
No	22.9%	n=19
Yes	18.1%	n=15

Figure 4: Follow up Information to EDDMapS

Next, respondents were asked if they themselves or their organization utilized outputs from EDDMapS (most commonly in the form of maps or excel spreadsheets). Forty-four percent of the 85 who answered the question responded that they did utilize outputs (n=37), compared to 34% who did not (n=29) and 22% that did not know (n=19). Outputs are a significant component of the EDDMapS resource. However, as indicated above, many of those that are using EDDMapS are not taking advantage of the available outputs. For this reason, respondents were asked about their level of satisfaction with EDDMapS outputs, of which 82 responded. Forty-nine percent (n=40) indicated that they are satisfied with the outputs, whereas 33% (n=27) "did not know" if they were satisfied (again suggesting that they probably are not really using them), 12% reported that the question was "not applicable" (as they indicated in the previous question that they did not utilize outputs), and 6% (n=5) reported that they were not satisfied with outputs.

An important part of assessing stakeholder experiences with a product, tool, or resource is identifying barriers. Respondents were asked what three things could be done to increase their use of EDDMapS. This was an open-ended question that all survey respondents were asked to provide a written response for (e.g., not just those that indicated that they use EDDMapS), of which 68 responded. A majority of respondents provided a comment about *"finding time to use [EDDMapS]"* knowledge, or awareness regarding EDDMapS usage. These comments included things like:

- ✓ *Prepare short "how to" paper for EDDMapS use by field staff.*
- ✓ *Refresher training and updates on all that it do.*
- ✓ *One-on-one training.*
- ✓ *More advertising, public relations.*

Some respondents (n=23) provided specific entry or output suggestions such as:

- ✓ *Better integration of EDDMapS with existing in-house GIS.*
- ✓ *The state borders need to have darker/thicker lines.*
- ✓ *Contact information available for the examiner (the person entered the data).*

Other comments were provided regarding work load or funding (n=14), such as:

- ✓ *If it were standard protocol for our organization. As it is now, it is duplicate effort in addition to our own database.*

- ✓ *Make it part of my job*

- ✓ *Money to hire OPS to do it for me*

Some comments were provided regard the EDDMapS app or mobile device (n=10):

- ✓ *If I had devices that can be used in the field (gps, iphone, etc)*

- ✓ *Owning a smart phone or tablet that would allow me to use EDDMapS while out in the field*

Finally, some comments were information-related (n=10) such as:

- ✓ *Reduce the number of other field tasks - increase employees*

- ✓ *Occasionally send a county or regional map of my area to me to encourage populating it with more data.*

- ✓ *An automatic email sent to land managers when a new IEP is found in their area*

- ✓ *I didn't know email alerts for specific species were available. Make this more visible on the website.*

Respondents were given space to write any additional comments about EDDMapS. Twenty-six provided comments about various topics, which are listed verbatim in a separate spreadsheet (see "SE-EPPC Survey Qualitative Responses").

RECOMMENDATIONS

Many SE-EPPC and state chapter supporters and participants are using EDDMapS as a data entry tool. However, there seems to be a barriers regarding available time, perceived work involved in using the tool, and confidence required to ensure that users understand how it works and can take advantage of the resource and its benefits. Though nothing can really be done about the individual's time available to use EDDMapS, it is apparent from the survey results that there are opportunities for enhanced awareness (e.g., advertising, public relations, marketing) and know-how (e.g., training, workshops, field exercises).

Survey results indicate that many users are not aware of the outputs available. This may be alleviated by the aforementioned recommendation to both advertise more and provide more training opportunities. EDDMapS is associated with some degree of technical know-how and the requirement of mobile devices (e.g., GPS, iphone/smart phone, ipad, etc.). This seems to be an area of confusion, as represented by the survey data. Some respondents suggested that they thought the only way to use EDDMapS was with a mobile device. These perceptions could likely be clarified with additional advertising and training opportunities.

The original task associated with this project focused largely on inputting bulk data into EDDMapS. However, this did not come up an issue with survey respondents. Also, with the hiring of a Data Coordinator who is available to help stakeholders and users upload data in multiple formats; any issues that may have existed previously have been alleviated. In advertising and training information, this should be emphasized (that there are resources available for direct assistance).

Finally, many respondents commented on the need for reminders or alert emails to keep them involved and engaged in EDDMapS. These communications could serve as a means to remind users that they have information that needs to be uploaded. It may be relatively easy to provide regular updates or maps regarding invasive species reports to each state chapter for dissemination to increase attention and participation. Perhaps these tasks could be completed by the Data Coordinator or other staff (if possible) without requiring too much additional work or resources.

PART 3: FACILIATING ANNUAL SHARING

Utilizing existing resources for enhanced sharing of Weed Alerts & updates to invasive plant lists (of SE-EPPC chapters)

While most chapters do share updates to invasive plant lists as well as new listings and Weed Alerts, there is no standard practice yet adopted by SE-EPPC to promote a more coordinated effort for sharing information. In consultation with the *Wildland Weeds* editor, and without creating any additional resources for sharing when there are adequate ones in place, the

recommendation is to utilize specific editions of *Wildland Weeds* in order to facilitate a more coordinated sharing effort.

If all of the chapters were aware of a specific deadline, for example, December 1 to meet the publication deadline for the first edition of each new year, they would get updates to the *Wildland Weeds* editor. This edition of the magazine would provide updates on all SE-EPPC chapter invasive plant lists and serve as a sharing tool and a reference for interested parties.

This recommendation would not create any new tools resources, and would not require any additional work on the part of chapter presidents, save the board's adoption of the process. It would likely work best if the *Wildland Weeds* editor provided a deadline that could be the same each year, and awareness of the deadline was made a priority. Once each chapter is familiar with the process (e.g., getting updates to editor December 1 each year), the goal of facilitating a more coordinated annual sharing effort can be achieved quickly and simply.

SURVEY RESULTS: ANNUAL SHARING IDEAS

One of the recommendations to facilitate a more consistent means of sharing information regarding updated invasive plant lists and Weed Alerts is to set up an annual deadline to submit information to *Wildland Weeds*, the official quarterly publication of the Florida and SE-EPPC Councils and all affiliated chapters. Respondents were asked if they thought this would be a good idea to promote more sharing of information. Of the 133 that responded, over 90 indicated that it was a positive idea that would likely lead to better coordination and awareness of invasive plant listing activities. Very few indicated that they did not think this was a positive addition (process).

- ✓ *It would certainly highlight similarities and differences (and maybe what's "missing"), and border states might be better alerted to invasions headed their way.*

Other ideas to promote a more consistent sharing process included promoting an online resource or website (n=37) such as ListServes, social media, the SE-EPPC website, and more. An additional 49 provided "other" suggestions including reaching out to other groups such as foresters, partner organizations, land managers, anglers, hunters, legislatures/policymakers, etc. For a complete list of suggestions, see "SE-EPPC Survey Qualitative Responses".

PART 4: CURRENT STATUS OF CWMAS & RECOMMENDATIONS FOR THE FUTURE

Understanding the current state of Cooperative Weed Management Areas in the Southeastern United States and exploring needs for the future

ABOUT

Cooperative Weed Management Areas (CWMAs) are partnerships dedicating to managing noxious/invasive weeds/plants in a specific region or area. They usually include: federal, state, and local government agencies, tribes, individuals, and other interested groups or stakeholders.

According to *CWMA: A Recipe for Success*, CWMAs can have different names in different parts of the country (Midwest Invasive Plant Network, 2011). For example, Cooperative Invasive Species Management Areas (CISMAs) focus on more general invasive issues (e.g. not just plants). There are also Partnerships for Regional Invasive Species Management (PRISMs), or Invasive Species Teams or Partnerships. Sometimes they are even dedicated to a single specific species. They can be organized in a variety of ways, but they share six basic characteristics:
1) They operate within a defined geographic area, distinguished by a common geography, weed problem, community, climate, political boundary, or land use.
2) They involve a broad cross-section of landowners and natural resource managers within the CWMA boundaries.
3) They are governed by a steering committee.
4) They have a long-term commitment to cooperation, usually through a formal agreement among partners.
5) They have a comprehensive plan that addresses the management of invasive species within their boundaries.
6) They facilitate cooperation/coordination across jurisdictional boundaries (MIPN, 2011, p. 5)"

CWMAs work to effectively control invasive plants across property lines. While some CWMAs have been started by government agencies "taking a larger, region-wide approach to invasive plant management, others have been formed by concerned citizens partnering with agencies, organizations, and corporations that can provide additional resources" (MIPN, 2011). No matter how the CWMA came about, the goal is the same: "to work together with all interested parties in

the area for more effective invasive plant management" (MIPN, 2011).

STATUS/ISSUES WITH CWMAS IN THE SOUTHEAST

CWMA-type organizations seem to be much different in the West compared to the Southeast. The concept of CWMAs has been slow to catch on in the Eastern US, perhaps because many people weren't sure how to implement the idea in a very different landscape. Eastern states generally share the same kinds of problems with invasive plants that are encountered in the West, yet in the East we also have some unique challenges (MIPN, 2011). Currently there are 339 reported CWMA-type organizations nationwide (Chuck Bargeron, personal communication, 10/24/12). While there are some CWMAs found in the East, there are far less than the West. For example, in the eight states that participate in SE-EPPC, there are a total of 30 CWMA-type organizations (19 of which are found in Florida) compared to 181 in eight western states (WA, ID, MT, UT, OR, NV, CA). See the Bugwood.org map of CWMAs in Appendix C for a depiction of CWMAs found throughout the United States.

In the southeast, many factors have been identified as the cause of the stark contrasts between the organization, frequency, and success of CWMAs in the West versus the Southeast. These factors are based on expert opinions and include following eleven points:

1. Organization: There are no County Weed Supervisors in the Southeast. County Weed Supervisors tend to play a vital role in CWMAs found in the West. They coordinate management and prevention activities, help with CWMA organization and leadership, actively control invasive plants, and provide an "on the ground" component to the CWMA structure. The strong influence of range lands in the West is likely the historical explanation for the need for local county-based weed management. This also is reflected in the West's tax base structure (e.g. weed levies) that fund CWMA efforts (Stephen Enloe, personal communication 10/30/12). Some sort of institutional framework is also helpful. While some states in the Southeast have county level Natural Resource Councils which might be helpful, it has reportedly been difficult to get them involved and functional in regard to the development and implementation of a CWMA (Nancy Loewenstein, personal communication 10/29/12).

2. Lay of the land: Most of the open land in the Southeast is forest. In the west, the livestock industry largely drove early efforts to control/prevent invasive species. The range lands

of the west were severely threatened by noxious weeds; there was a real and present danger, which led to political pressure on the part of livestock owners (Stephen Enloe, personal communication 10/30/12).

3. Lack of government ownership/ownership patterns. Almost all of the Southeast (with exception of timber companies) are owned private individuals (+/- 95% private). There are very limited federal agencies (and public lands). State lands much less numerous in the Southeast as well (than west). Also, government agencies out west have more coordinated efforts to work on invasive species issues (Stephen Enloe, personal communication 10/30/12 and Nancy Loewenstein, personal communication 10/29/12).

4. No motivating sense of crisis. With the exception of cogongrass in the Southeast (which has a single species focus), there seems to be no real sense of crisis regarding invasive plants. There is a commonly held perception of invasive species as being a futile effort. "There are invasives out of the box that we're not going to get back in and people know it" (Stephen Enloe, personal communication 10/30/12).

5. Lack of funding. Successful CWMAs have support of County Weed supervisors and local weed levies (as discussed earlier). In the southeast, there is a lack of dedicated long-term funding for projects, efforts, and cost-share opportunities. Cost-share money more focused on invasive species issues and management in the West (Stephen Enloe, personal communication 10/30/12, Nancy Loewenstein, personal communication 10/29/12, and Chuck Bargeron, personal communication 10/24/12).

6. Lack of leadership. The few successful CWMAs in Southeast have had champions (e.g. one individual who makes it happen). Without dedicated staff who are paid to work on invasive species as part of their regular activities, it is difficult to get things done on a large scale (Stephen Enloe, personal communication 10/30/12, Nancy Loewenstein, personal communication 10/29/12, and Chuck Bargeron, personal communication 10/24/12). For example, attendance at a SE-EPPC conference might be around 100. Compare this to attendance at an invasive species conference in the West with 200-300 in attendance (Chuck Bargeron, personal communication 10/24/12).

7. Absentee land ownership. Large tracts of land in the Southeast are owned by private individuals (for example, private hunting lands). Some large tracts are owned by timber companies or Timber Investment Management Organizations (TIMOs), but while some are actively engaged in invasive species management, others are not. Many of these companies are managing a lot of land and invasive species prevention/management/control is not a huge component (Stephen Enloe, personal communication 10/30/12).

8. Policy is way behind in the Southeast. The West saw negative impacts of invasive plants on livestock, which was huge impetus for coordination and formation of CWMAs. Many Southeastern states utilize the national noxious weeds list, but have no teeth and little funding to enforce policy and no incentive to add invasive species to the noxious weed list (Stephen Enloe, personal communication 10/30/12).

9. Different concepts of CWMAs. Some states/groups in the Southeast have approached the concept of CWMAs differently than in the West. While most CWMAs in the West are organized on a regional or county level, a few states in the Southeast have taken a much bigger approach. For example, large tracts of land in Georgia and South Carolina have been declared CWMAs and the entire state of Mississippi is one CWMA . It could be that the success of CWMAs in the West has something to do with the scale at which they are able to make a tangible difference (Chuck Bargeron, personal communication 10/24/12).

10. Differences in size, circumstances and culture. Counties in the West are huge. For example, there are 67 counties in Alabama and Florida, 100 in GA, many of which are rural with low populations and therefore low tax base. Compare this to 23 counties in Wyoming (e.g., huge counties, large tax base). Also, many western counties have substantial tax revenues from natural resource extraction (e.g., energy/oil/etc.) which is not the case in the Southeast.. Many of these efforts depend on volunteers, and most volunteer bases come from urban areas. (Stephen Enloe, personal communication 10/30/12). However, much of the Southeast is very rural and there does not seem to be the "critical mass" required to make things happen on a big scale for CWMA-type organizations in the Southeast (Chuck Bargeron, personal communication 10/24/12). The tradition of being independent in the southeast probably also contributes (Nancy Loewenstein, personal communication 10/29/12).

11. Florida is different. While there are not very many organized and/or successful CWMAs in the Southeast, there are a few exceptions. One of these seems to be Florida. Reasons for this include that the "jumped on invasives a lot earlier," have more navigable waters that were impacted by aquatic invasive plants, and have more people focused on invasive species issues (Chuck Bargeron, personal communication 10/24/12 and Stephen Enloe, personal communication 10/30/12).

SURVEY RESULTS: THOUGHTS ON CWMAS/CISMAS

Survey respondents were asked a few questions about their thoughts and experiences about CWMAs/CISMAs in their respective states. First, they were asked an open-ended question regarding whether CWMAs/CISMAs existed in their home state and if so, if they knew how many. Of the 91 respondents who answered, 60 reported that there were CWMA-type organizations in their state. Thirty-one reported that either there were none that they knew of or they simply did not know. While many of those who knew CWMA-type organizations existed in their state could provide an exact number, many said "lots," "many," or a "few." See the "SE-EPPC Survey Qualitative Responses" spreadsheet for a list of all of the responses.

Respondents were asked what they thought were the three barriers, if any, to implementing successful CWMAs in their state. This was an open-ended question that yielded 69 responses. Of these, the majority suggested that funding or resources were the number one barrier (n=66), which included such comments as "*sustained funding*," "*staff shortages*" or "*funding for dedicated oversight of program."* There were 20 comments regarding a need for enhanced communication or education, which could include simply knowing about the existence of CWMA-type organizations, general awareness of the issues, or related policies, such as:

- ✓ *Lack of knowledge of their existence*
- ✓ *Lack of communication and outreach*
- ✓ *Public and politicians are not aware of benefits of CWMAs*
- ✓ *Communication between agencies*

Respondents provided 17 comments focused on leadership, or more specifically, a lack of leadership or "champions" for the cause.

- ✓ *Willing and Active Leadership (salaried position)*

- ✓ *Impassioned leadership*
- ✓ *Need someone to lead the effort*

There were 16 comments regarding the need for collaboration. Examples of collaboration comments included: "*Getting diverse groups to work together*," "*Lack of interagency coordination*," and "*lack of 'buy-in' with private and local gov't land owners.*" In addition, there were 27 comments regarding other topics. A sample of these comments include:

- ✓ *Maintaining active participation*
- ✓ *Complicated process*
- ✓ *Obtainable, realistic goals*
- ✓ *The feeling that you're making a difference*

Respondents were asked to select from a number of ideas on how to improve the number and success of CWMAs/CISMAs in their home state. They were also encouraged to write in other ideas. Thirty-three percent (n=73) of respondents indicated that sustained funding would be the most important measure. This was followed by education and awareness on invasive plant issues as well as CWMAs/CISMAs themselves. See *Figure 5* for a breakdown.

Measure (to improve number/success of CWMAs)	**Percentage**	**Frequency**
Sustained funding	33.2%	N=73
Increased education/awareness of invasive species issues	31.8%	N=70
Increased education/awareness of CWMAs/CISMAs	31.8%	N=70
Enhanced coordination between states/agencies	28.2%	N=62
Increase in available cost share funds	27.3%	N=60
Developing & maintaining effective leadership	25.0%	N=55
More pilot/demo projects	23.2%	N=51
More volunteers	18.2%	N=40
Better policy	10.0%	N=22

Figure 5: Measures to improve CWMAs

Finally, respondents were provided space to write any other ideas they might have to improve the number and success of CWMA-type organizations not just in their home state, but across the Southeast. The 53 responses were varied, but among the most comments were comments and suggestions about funding, outreach and communication, leadership, increased coordination, awareness, and centralized structure. Examples include:

- ✓ *Success breeds success, focus on quality not quantity, facilitate personal relationships among stakeholders.*
- ✓ *Tangible reasons for participation*
- ✓ *The success could be improved by getting more private landowners on board*
- ✓ *Perhaps SEEPPC could provide some coordination in this area - trainings and conferences dedicated to CWMA/CISMA development and implementation would be helpful.*
- ✓ *Increase funding. Concentrate on specific objectives*
- ✓ *Fund someone to take the lead*
- ✓ *Educate policy makers on the cost of no action*
- ✓ *Centralized organization structure -- Incident Command System Structure for example.*

SUMMARY/RECOMMENDATIONS

Expert opinions regarding the status of CWMA-type organization in the southeast were largely echoed by stakeholders in the SE-EPPC survey. Funding, organization, and leadership came up often. Stakeholders touched on what could be a very important aspect as well: the need for increased education and awareness not just about invasive species impacts and issues, but also what a CWMA-type organization is, how they function, and why they are important.

One way to increase the awareness of CWMA groups and benefits is to highlight success stories. There have been a few examples of relatively successful CWMA-type organizations in the Southeast, which include the Cogongrass Task Force, the Kudzu Coalition, and several CISMAs in Florida (Stephen Enloe, personal communication 10/30/12). Increasing publicity and spreading the word about success stories is a great way to inspire stakeholders to work together to create CWMA solutions. However, as discussed above, there are necessary resources for implementing successful CWMAs (e.g. sustained funding and leadership) as well as major differences between the vast number and success of CWMAs in the West and their Eastern counterparts that need to be addressed to improve CWMAs in the southeast (e.g. maybe the

same type of setup is not as appropriate for the East and thus should be modified or completely transformed). Acknowledging the differences is a first step and working towards targeted solutions that may be unique to the Southeast is another. Without sustained funding, a good organizational structure, and effective leadership, a CWMA-type organization can be a very difficult thing to sustain (Gunderson-Izurieta, Paulson & Enloe, 2008).

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APPENDIX A: FINAL SURVEY INSTRUMENT

Southeast Exotic Pest Plant Council (SE-EPPC) Survey of Chapters

Demographic Information

1. In which state do you reside?

- ◯ Alabama
- ◯ Florida
- ◯ Georgia
- ◯ Kentucky
- ◯ Mississippi
- ◯ North Carolina
- ◯ South Carolina
- ◯ Tennessee
- ◯ Other (please specify)

2. What organization do you represent (in your state chapter of SE-EPPC)? (e.g. private citizen, Native Plant Society, U.S. Forest Service, state agency, etc.)

3. How active are you in your state chapter of SE-EPPC?

- ◯ Very active
- ◯ Somewhat active
- ◯ Neither active nor inactive
- ◯ Somewhat inactive
- ◯ Not active at all

Invasive Plant Listing

4. Do you think that there could/should be increased consistency of invasive plant listing methodology (e.g. how plants are ranked as how, med, high risk) across SE-EPPC chapters?

- ◯ Yes
- ◯ No
- ◯ Maybe

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Southeast Exotic Pest Plant Council (SE-EPPC) Survey of Chapters

5. What do you think are the pros & cons of enhanced consistency in invasive plant listing methodology?

6. Has the invasive plant listing process (for your state) been controversial?

- ◯ Yes
- ◯ No
- ◯ Do not know

7. Have any particular species been controversial? (If YES, please specify which species and the nature of the controversy in the space below. If NO, please move on to the next question.)

8. How does your organization/state chapter determine what species/taxa area a priority?

9. Does your (state) chapter generally have good participation in invasive plant listing activities?

- ◯ Yes
- ◯ No
- ◯ Do not know

Sharing of Information & Updated Weed Lists

10. If each SE-EPPC chapter were asked to submit their updates to invasive plant lists to a specific edition of WILDLAND WEEDS once a year, do you think this would better facilitate the sharing of information among states?

Southeast Exotic Pest Plant Council (SE-EPPC) Survey of Chapters

11. Do you have any other ideas for sharing updates to invasive plant lists & weed Alerts?

Use of EDDMapS

12. Do you/your organization utilize EDDMapS for reporting/mapping/tracking invasive plant infestations?

- ◯ Yes
- ◯ No
- ◯ Do not know

13. Does your organization require the use of EDDMapS?

- ◯ Yes
- ◯ No

14. How often would you say you/your organization utilizes EDDMapS?

- ◯ Frequently/regularly
- ◯ Sometimes
- ◯ Not very often
- ◯ Never

15. Does your organization/state chapter participate in the verification process (of EDDMapS reporting)?

- ◯ Yes
- ◯ No
- ◯ Do not know

16. Do you (or anyone in your organization that you know of) usually submit bulk data or individual infestation information?

- ◯ Yes
- ◯ No
- ◯ Do not know

Southeast Exotic Pest Plant Council (SE-EPPC) Survey of Chapters

17. Have you ever had an issues using or submitting data to EDDMapS?

18. Do you/your organization follow up with updated information or treatment results to reported infestations on EDDMapS?

- ◯ Yes
- ◯ No
- ◯ Do not know
- ◯ Did not know that was an option

19. Do you/your organization utilize outputs (e.g. maps, excel spreadsheets, email alerts for specific species, etc.) available through EDDMapS?

- ◯ yes
- ◯ No
- ◯ Do not know

20. Are you satisfied with the outputs provided by EDDMapS?

- ◯ Yes
- ◯ No
- ◯ Do not know
- ◯ Not applicable

21. What are the three the things that could be done to increase your use of EDDMapS? (Please write your answers in ranking order with 1 being the best solution)

1.
2.
3.

22. Do you have any other comments about your organization/state chapter's use of EDDMapS?

Cooperative Weed Management Areas (CWMAs)

Southeast Exotic Pest Plant Council (SE-EPPC) Survey of Chapters

23. Do you know of any CWMAs/CISMAs in your state? If so, how many are there?

24. What are the top three barriers to implementing successful CWMAs in your state? (Please write your answers in ranking order with 1 being the biggest barrier)

1.
2.
3.

25. What could be done to improve the number and success of CWMA-type organizations in your state? (Select all that apply)

- [ ] Increase in sustained funding
- [ ] Increase in available cost-share funds
- [ ] Increase in coordination between states/agencies
- [ ] More pilot & demonstration projects
- [ ] Increased education/awareness about CWMAs
- [ ] Enhanced public awareness of invasive plant issues & impacts
- [ ] Developing & maintaining effective leadership
- [ ] More volunteers
- [ ] Better policy

Other (please specify)

26. What, in your opinion, could be done to improve the number and success of CWMA-type organizations across the southeast?

27. If you could add one more question to this survey, what would it be?

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APPENDIX B: MISSISSIPPI EXOTIC PLANT PEST COUNCIL RANKING GUIDELINES

Noteworthy Exotic Plant Species of Mississippi

Purpose of the list

This list of Noteworthy Exotic Plant Species of Mississippi includes important plant species known to occur in the state of Mississippi but whose native ranges lie outside the state.

The list includes information about the potential invasion risk posed by each species and is meant to serve as an educational tool to aid agencies, water and watershed managers, and private landowners in making management decisions.

Information provided includes the real or perceived risk that each species presents for degradation of natural habitats or for economic impacts on agriculture, horticulture, and turf management within the state of Mississippi or in immediately neighboring states.

This list was developed by the Mississippi Exotic Pest Plant Council, in cooperation with regional botanists and other stakeholders.

The list can be found at the following locations on the internet.

Mississippi Exotic Pest Plant Council: www.se-eppc.org/mississippi/

Invasive Plant Atlas of the Mid-South: www.gri.msstate.edu/ipams/MSExotics.php

Please send comments on the list and related activities to Gary N. Ervin at gervin@biology.msstate.edu

Criteria for evaluating plant species for inclusion on the MS-EPPC Mississippi Exotic Plant Species List

These criteria are modified from those provided by the Alabama Invasive Plant Council and the Tennessee EPPC.

Each species on the list will be placed into one of four risk categories, described below. This is in accordance with procedures employed by the other SE-EPPC states. This information can be provided in column "D" in the Excel file.

Category 1:

1) The plant species, sub-species, or variety is non-native to Mississippi.
2) The plant has the potential for rapid growth, high seed or propagule production and dispersal, and establishment in natural communities or in managed areas where it is not desired.
3) The plant is able or known to be able to out-compete other species in plant communities or cropping systems, thereby impacting native plant biodiversity, ecosystem functions, or crop productivity.
4) The plant persists in free living infestations within Mississippi, without cultivation or other human assistance.
5) The plant is widespread and occurs in three or more MS physiographic regions, which are:
   1. Tombigbee Hills
   2. Blackland Prairie/Blackbelt
   3. North Central Hills
   4. Loess Hills
   5. Alluvial Valley (Delta)
   6. Jackson Prairies
   7. South Central Hills
   8. Pine Belt
   9. Coastal Zone
   10. Barrier Islands

   A map of these physiographic regions is included; these are as provided by the Mississippi Automated Resource Information System (MARIS).
6) The plant is known to occur in dense stands of numerous individuals in frequent infestations.

Category 2:

1) The plant meets criteria 1-4 for a Category One species.
2) The plant occurs within one or more cultural uses (row cropping, silviculture, etc.) and in more than one MS physiographic region.
3) The plant occurs as scattered individuals or widely scattered dense infestations; i.e., *not* in frequent dense stands.

Category 3:

1) The plant meets criteria 1-3 for a Category One species.
2) The plant has recently appeared as free living populations within Mississippi, ***or***
   The plant is invasive in nearby states but its status in Mississippi is unknown or unclear, and it has the potential to become invasive in Mississippi, based on its biology and its colonization history elsewhere, especially in the southern US.

Watch list:

1) The plant meets criteria 1-3 for a Category One species.
2) The plant is cultivated in Mississippi, but is not known to occur in the state without human assistance, i.e., not in free-living populations.
3) The plant has a documented history of invasiveness in other areas of the Southeast and/or is recognized as an invasive plant in parts of the world having habitats similar to those in the Southeast.

If species are ranked in Categories 1-3 in an adjacent state and the review process yields no information specific to Mississippi, the species will be assigned a corresponding risk category for the Mississippi List.

We will remove a species from the list if a majority of reviewers suggest such is merited and the species is not ranked in Categories 1-3 in an adjacent state. Rankings in adjacent states will take precedence over species removal in all cases, unless quantitative support is provided to the contrary.

Please send comments on the list and related activities to Gary N. Ervin at gervin@biology.msstate.edu

Mississippi Physiographic Regions

Please send comments on the list and related activities to Gary N. Ervin at gervin@biology.msstate.edu

We also want to provide information for each species on potential risk level in each of five risk categories. With the exception of Economic Impact, these are taken directly from the NatureServe Invasive Species Assessment Protocol (version 1).

In columns "E"-"I" of the Excel file, please provide a ranking of 0-3 for each risk category, corresponding to your best estimate of the risk posed by each species with which you are familiar. These values would correspond with a perceived risk level of Insignificant (0), Low (1), Medium (2), or High (3), given the types of considerations listed under each category below.

I. Ecological Impact

Impact on Ecosystem Processes and System-Wide Parameters
Impact on Ecological Community Structure
Impact on Ecological Community Composition
Impact on Individual Native Plant or Animal Species
Conservation Significance of the Communities and Native Species Threatened

II. Current Distribution and Abundance

Current Range Size in Region
Proportion of Current Range Where Species Is Negatively Impacting Biodiversity
Proportion of Region's Biogeographic Units Invaded
Diversity of Habitats or Ecological Systems Invaded in Region

III. Trend in Distribution and Abundance

Current Trend in Total Range Within Region
Proportion of Potential Range Currently Occupied
Long-Distance Dispersal Potential Within Region
Local Range Expansion or Change in Abundance
Inherent Ability to Invade Conservation Areas and Other Native Species Habitats
Similar Habitats Invaded Elsewhere
Reproductive Characteristics

IV. Management Difficulty

General Management Difficulty
Minimum Time Commitment
Impacts of Management on Native Species
Accessibility of Invaded Areas

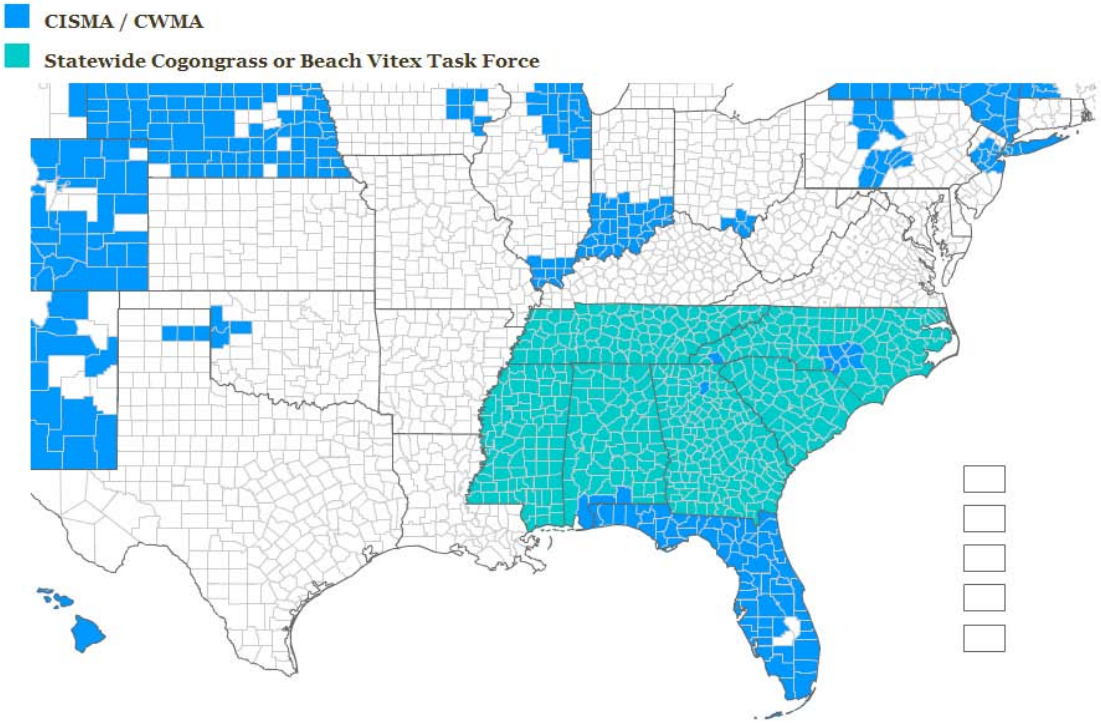
V. Economic Impact

Contributes to decreased yield in agronomic systems
Contributes to decreased vigor in turf or horticultural systems
Costly management necessary for eradication
Multiple iterations of management necessary for eradication
Limited options for restoring formerly infested lands to productive state

Please send comments on the list and related activities to Gary N. Ervin at gervin@biology.msstate.edu

APPENDIX C: MAP OF CWMAS

Above: Map of CWMAs/CISMAs across the United States (Map courtesy of Bugwood: http://www.invasiveplantcenters.org/cwmamap.cfm)



Above: Map of Southeast CISMAs/CWMAs (Maps courtesy of Bugwood: available at http://www.invasive.org/cismas/southern.cfm)