

Final Independent External Peer Review Report for National Wetland Plant List Update - 2010

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Prepared for
Department of the Army
U.S. Army Corps of Engineers
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SHORT-TERM ANALYSIS SERVICE (STAS)

**FINAL REPORT
INDEPENDENT EXTERNAL PEER REVIEW**

of the

National Wetland Plant List Update - 2010

Prepared by:

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For

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Scientific Services Program

The views, opinions, and/or findings contained in this report are those of the author and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

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Attachment A: National Wetland Plant Panel Conference Call Meeting Minutes

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Attachment D: Charge Questions and Reviewer Comments

LIST OF ACRONYMS

DK	Don't Know
EC	Engineering Circular
EPA	Environmental Protection Agency
ERDC	Engineering Research and Development Center
FAC	Facultative (plant indicator category)
IEPR	Independent External Peer Review
IQA	Information Quality Act
MLRA	Major Land Resource Area
MOU	Memorandum of Understanding
NWPL	National Wetland Plant List
NP	National Wetland Plant Panel
NRCS	Natural Resources Conservation Service
PI	Plant Indicators
OMB	Office of Management and Budget
QA	Quality Assurance
RP	Regional Wetland Plant Panel
R1	Voting Round 1
R2	Voting Round 2
R3	Voting Round 3
SOW	Scope of Work
USFWS	United States Fish and Wildlife Service

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1.0 INTRODUCTION

The objective of this work is to conduct a review of the process used to update the National List of Plants Species that Occur in Wetlands (List) as required by the Information Quality Act (IQA) and associated guidelines. Independent external peer reviews (IEPRs) are conducted to ensure the quality and credibility of U.S. Army Corps of Engineers (USACE) decision documents. IEPRs follow the procedures described in the Department of the Army, U.S. Army Corps of Engineers, Water Resources Policies and Authorities' Civil Works Review Policy (Engineering Circular (EC) 1165-2-209) dated January 31, 2010 (USACE, 2010); CECW-CP Memorandum dated March 31, 2007; and the Office of Management and Budget's (OMB) Final Information Quality Bulletin for Peer Review released December 16, 2004 (OMB, 2004).

The USFWS originally developed the "National List of Vascular Plant Species that Occur in Wetlands" in 1988 (List88) as part of their National Wetlands Inventory procedure for mapping wetlands in the United States. Plant taxa included in List88 were assigned qualitative plant indicator (PI) values based on available information concerning their frequency of occurrence in wetland habitat and these PIs are routinely used to identify jurisdictional wetland boundaries as required under Section 404 of the CWA (or approved state CWA Section 404 programs). A revision of the NWPL was drafted in 1996 (List96); however, it was never formally adopted for use. In 2006, the USACE along with EPA, USFWS, and NRCS were signatories of a Memorandum of Understanding (MOU), which transferred responsibility for updating and maintaining the NWPL from the USFWS to the USACE. In determining the an updated List would assist the USACE in "operating a more predictable, transparent, and scientifically-based regulatory program" it was agreed that the USACE would take lead responsibility for updating the List, make it available to all agencies and interested parties and provide adequate funding for its maintenance in the future.

This purpose of this IEPR is to ensure that the final List is developed based on the best scientific information that can be utilized in its development, within the time and material resources available, and that it is consistent with the needs and use of the List in the Regulatory Program. Battelle (a 501(c)(3) organization and Outside Eligible Organization (OEO)) has provided support to USACE for IEPRs since 2005. This IEPR was conducted for the USACE using a review process that was developed by Battelle to comply with USACE guidance (EC1105-2-410 (USACE, 2008), EC1165-2-209 (USACE, 2010)); CECW-CP Memorandum dated March 30, 2007 (USACE, 2007); and the OMB's peer review bulletin (2004). As part of the review process, charge questions were developed regarding key issues raised in individual sections of each document so that the scientific accuracy, reliability, and consistency with current scientific knowledge of the process could be evaluated.

This report briefly describes the IEPR process and summarizes preliminary findings of the IEPR process conducted through 2010. Section 2.0 includes a description of the Battelle reviewers involved in this in this review process, presents a discussion of the approach employed and a summary of the comments prepared for each of the documents and guidance materials reviewed. Section 3.0 provides conclusions related to the scientific accuracy, reliability, and consistency with current scientific knowledge of the revised list and recommendations. Attachments to this report include the following:

- Attachment A – National Wetland Plant Panel Conference Call Meeting Minutes
- Attachment B –Guidance
- Attachment C – Miscellaneous Communications
- Attachment D – Charge Questions and Reviewer Comments

2.0 TECHNICAL DISCUSSION

Battelle was tasked to meet with the USACE to discuss the overall project deliverable and the procedure for developing the updated List and to conduct independent reviews of various documents provided by the USACE and the project website. In addition, the Scope of Work (SOW) required that Battelle review comments received on the draft List and evaluate both the categorization process and the responses for consistency and scientific soundness. Specified reporting requirements included interim reviews of USACE documents and conclusions and preparation of a final report summarizing the work performed and the results and conclusions that were to be submitted within thirty days of receipt of the final draft List.

The project was initiated when the Battelle scientists met with the Contracting Office Representative (COR), Mr. Timothy Pangburn, and the chief scientist directing the update process, Dr. Robert Lichvar, both located at the Cold Regions Research and Engineering Lab (CRREL) in Hanover, NH in February, 2009. At this meeting the project goals and schedule were discussed along with the general external peer review approach. Dr. Lichvar provided some reference materials including meeting minutes from the inaugural meeting of the National Wetland Plant Panel (NP) in which the approach to updating the List was discussed. Throughout the review process, he also regularly provided additional guidance documents, various emails that he sent out to the Regional Panel (RP) members involved in the update process, and additional minutes from subsequent NP teleconference calls.

Although the SOW specified that Battelle would receive five documents that would be the focus of the IEPR, only two peer-reviewed documents were produced to support the update process (i.e., Lichvar & Minkin, 2008 and Lichvar & Kartesz, 2009a). Battelle discussed the contract requirements with Dr. Lichvar, who served as the technical point of contact throughout the project, and it was agreed that the remaining three documents would consist of NP minutes for various meetings or teleconference calls that occurred between 2007 and 2010, several guidance documents prepared for the RPs and miscellaneous communications between the NP and RP members. These documents were compiled and are presented in Attachments A (NP meeting minutes), B (additional guidance) and C (miscellaneous communications).

To summarize, the individual documents and guidance materials reviewed included the following components:

- Concepts and Procedures for Updating the National Wetland Plant List (Lichvar & Minkin, 2008);
- Nomenclature and the National Wetland Plant List (Lichvar and Kartesz, 2009a);
- Notes summarizing various meetings held between July 25-26, 2007 and August 25, 2010 by the interagency National Wetland Plant Panel (NWPP);

- Various memoranda (from July 9, 2009 to October 18, 2010) prepared by the NWPP to provide guidance regarding the voting process to the RPs; and,
- Miscellaneous emails and communications (from January 23, 2009 to September 1, 2010) primarily from Dr. Lichvar to RPs.

In addition, the project website was reviewed.

2.1 Schedule

The Scope of Work (SOW) specified an aggressive schedule, with a final report due within one year from the notice to proceed (16 July 2008). As a result of schedule delays in finalizing the approach for updating the List, a contract extension was requested and granted in December 2009 that extended the period of performance for this work to 31 December 2010.

Unfortunately, the voting cycles overseen by the NP have required more time than anticipated and the project will not be completed until sometime in 2011. As mentioned above, this report was prepared to summarize preliminary findings of the IEPR process conducted through 2010.

2.2 Reviewers

The principal staff (i.e., Battelle team) involved in this IEPR was Norman Richardson, a senior research scientist with Battelle and Dr. Michael Sackschewsky, a senior research scientist at the Pacific Northwest National Laboratories (PNNL). Karen Johnson-Young, who provided technical oversight for the project, has been external peer reviews for USACE since 2005. She was instrumental in developing Battelle's approach for conducting IEPRs that are compliant with USACE guidance and has provided programmatic oversight for more than 70 peer review projects for the Army.

Norman Richardson served as both the project manager and technical reviewer for the project and has a M.S. in Science Education (University of Pennsylvania) and an A.B. from Dartmouth College. He has over 22 years experience conducting jurisdictional wetland delineations throughout the eastern U.S. and is familiar with many of the regional and state-specific wetland indicator lists. In addition, he has provided technical oversight for various aquatic restoration projects and is currently assessing the interactions between coastal ecosystems and infrastructure in developing adaptive responses to projected climate change impacts. He has served as a Conservation Commissioner for the City of Newton, MA for nearly two decades, where he has been responsible for overseeing implementation of the state wetland protection regulations.

Dr. Michael Sackschewsky is a botanist with research interests in rare plant botany, community ecology, resource management, and environmental remediation and restoration. He received a B.A. in environmental biology from the University of Colorado in 1983 and his Ph.D. in Botany from Washington State University in 1987. In addition to providing technical review for this project, he currently oversees the ecological compliance review activities for the U.S. Department of Energy Hanford Site, including performing and evaluating field surveys for rare plant and animal species, wetlands, and rare habitats, and assessing potential impacts of proposed projects. His work includes the design and implementation of mitigation and habitat restoration actions, developing methods for habitat analysis and mapping using GIS based approaches, and evaluating revegetation and habitat restoration techniques. He provides general botanical and

rare plant expertise for the Hanford Site and the lower Columbia basin. He has additional field research experience in Colorado and the Mojave Desert.

2.3 Charge Preparation and Conduct of the Peer Review

Each document described above was reviewed by the Battelle team and following a discussion regarding the key issues, draft charge questions for each were prepared, discussed, and finalized. Charge questions for the five documents as well as the review of the website are provided in Attachment D (Tables D-1 through D-6). Periodically, the Battelle team conducted teleconference calls with Dr. Lichvar to discuss the review process and technical issues that arose throughout the project.

2.4 Summary of the List Update Process

The update of the NWPL began with a two-day meeting in late July, 2007 held by the NP, which consists of representatives of each of the four federal agencies that were signatories of the 2006 MOU. The NP discussed a number of issues that are important to the update process, including the definition of a wetland plant; the basis for different status levels, and the inherent problems with measuring frequency of occurrence; the utility of the + / - qualifiers; the importance of a scientific basis for the rating assignments, and the difficulty in obtaining that level of scientific data. The group also discussed issues such as taxonomic changes since publication of the List88, the concept of assigning different ratings to different subregions within a larger region, and the use of a web-based voting system to support development of the NWPL update.

Much of the results of the initial discussion were published as *Concepts and Procedures for Updating the National Wetland Plant List* (Lichvar and Minkin, 2008). This document provided a history of wetland plant lists for the United States, and discussed some of the strengths and limitations of the earlier versions of the NWPLs (i.e., List88 and List96). The document described the plan for the current update, provided an overview of technical issues, and provided guidance for the RPs that would be making most of the rating determinations. Regional Panels were developed for each of 10 regions, each panel consisting of one representative from each of the four cooperating federal agencies.

As originally envisioned, there were to be two rounds of voting by the RPs, with the NP responsible for final determinations for problematic species and overall NWPL compilation. However, after R1 voting the ratings for a large majority of the species were not resolved, primarily because the RP members were not familiar enough with the species to assign a rating based on knowledge. The NP decided to input the List96 ratings as a default for any missing votes and to drop the ratings for each variety within a species, and assign ratings only at the species level. This greatly reduced the number of unresolved species. The second round of RP voting did not resolve a large number of species, but again the List was reduced by applying the List96 values as surrogate votes.

Following R2, there was still a greater number of unresolved species than expected. The NP decided to hire a group of outside experts for each region, made up of academic and professional botanists and wetland scientists. This group evaluated the unresolved species, and additional species that the NP had determined needed additional evaluation (including all former FAC-species). At this point Dr. Robert Mohlenbrock (professor emeritus, Southern Illinois University) was also hired to help resolve approximately 1,700 species nation-wide. The

external botanists and Dr. Mohlenbrock constituted the R3 voting panel. In general, when the determinations of the R3 voters differed from the earlier votes by the RPs, the NP preferentially used the R3 results.

R3 resolved most of the remaining species, but those that were not were reviewed by various members of the NP in a fourth round of voting. Round 5 consisted of the resolution of some disputes between the RPs and the expert panel reviewers.

2.5 Findings from Individual Review Components

The following subsections provide a summary of the panel responses for each of the review documents. A discussion of dominant themes that were identified across much of the review material is provided in Section 2.6.

2.5.1 Concepts and Procedures for Updating the National Wetland Plant List

The website (see Section 2.4.6) provides a link to this document. Charge questions and panel responses are provided in Table D-1 in Attachment D. The reviewers found this document to provide an excellent overview of the proposed approach, with the key issues that needed to be revised/updated described and reasonable solutions identified. The overall approach was designed to make the underpinnings of the nation's wetland indicators a more transparent and scientifically-rigorous process. The NP also clearly intended to make the information supporting important decision-making more accessible to general stakeholders. Overall, the reviewers felt that the proposed approach would meet the stated goals of the update process, while anticipating a number of issues (e.g., tie-breaking rules, RP agreements) that developed during the actual voting process.

2.5.2 Nomenclature and the National Wetland Plant List

The website (see Section 2.4.6) provides a link to this document. Charge questions and panel responses are provided in Table D-2 in Attachment D. Both reviewers felt that while the document provided a useful general summary of taxonomic principles, the intended audience for the document was not clear. The discussion on treating plant varieties/subspecies became obsolete after the decision to eliminate these from the updated list.

2.5.3 National Wetland Plant Panel Meeting Minutes

Attachment A provides a compilation of all meeting minutes from the NP from 26-27 July 2007 and 25 August 2010. Charge questions and panel responses are provided in Table D-3 in Attachment D. The notes summarizing the NP considerations throughout the update process demonstrate that a thoughtful, consensus-based approach underlay all decision-making. However, the reviewers concluded that the conceptual approach (Section 2.5.1) failed to consider a number of issues that ultimately required that mid-course corrections be taken. The outcome of some of these actions was to diminish the hoped for improvements in the scientific basis for the revised PIs. Nonetheless, adjustments such as the revised indicator category definitions, elimination of PI qualifiers (i.e., +/-), and use of the expert botanical panels (with perhaps a broader perspective regarding the distribution of plant taxa across landscapes), resulted in the updated PIs being much better reconciled with the available information than were earlier lists. While the NP's goal related to the consideration of subregional distinctions in habitat occurrence frequencies was not fully realized in this update cycle, the updated process is now flexible

enough to do so in the future as these types of issues arise. The reviewers viewed this as another example of the far sightedness and comprehensive planning that the NP brought to their charge. The reviewers did suggest that a more thorough Quality Assurance (QA) program should be instituted, or at least documented. Also in a number of instances, information that the reviewers would like to have seen was not available.

2.5.4 Additional Guidance Documents

Attachment B provides a compilation of various guidance documents dating from 9 July 2009 and 29 March 2010. Documents were prepared by the NP and submitted to the RPs to provide guidance during the voting rounds. Charge questions and panel responses are provided in Table D-4 in Attachment D. In general, the reviewers concurred that the guidance prepared for the RP was clear and comprehensive although some valuable guidance was not made available to the RPs until after R1 had be completed. There was also some question whether the NP should have taken a more activist role in ensuring that the RP members across the regions all shared a common understanding of their charge (particularly with regard to landscape-level distribution perspective) and level of commitment and capability.

2.5.5 Miscellaneous Communications to Regional Panel Members

Attachment C provides a compilation of miscellaneous communications from Dr. Lichvar (email dates ranging from January 2009 to August 2010) to the RP members. Charge questions and panel responses are provided in Table D-5 in Attachment D. Among other issues that were also considered in Sections 2.5.4 and 2.5.5, the reviewers again raised some questions about the adequacy of the QA program and whether issues were addressed in a satisfactory manner once they had been identified. While it is recommended (see Section 3.2) that the QA procedures in place be made more explicit (or enhanced if necessary), part of the concern raised may have been due to a lack of understanding exactly what the procedures used were. It is suggested that the background information about the process utilized be supplemented or updated where necessary and made available.

2.5.6 National Wetland Plant List Website

The NWPL website (Lichvar and Kartesz, 2009b) is available at the following link: https://wetland_plants.usace.army.mil. Charge questions and panel responses are provided in Table D-6 in Attachment D. The reviewers found the website development to be a substantial improvement to the process, of great heuristic value as a standalone resource, and which will likely be appreciated by all cross-sections of interested parties. A number of the recommendations (Section 3.2) relate to updating the website platform to make the process more transparent, clear, and of greater utility.

2.6 Evaluation of Specific Issues

The following section summarizes the findings of a number of issues that were specifically considered in the IEPR evaluation. These include impact of eliminating the +/- ratings qualifiers, resolution of outdated taxonomy, regionalization/subregionalization, use of the List 96 default values, and development of the website platform.

Rating Qualifiers. One of the first decisions made during the NWPL update was to eliminate the use of the “+” and “-“ qualifiers on the ratings. These were originally used as compromises to

resolve differences in opinion between reviewers on earlier lists. Eventually, they came to represent specific ranges of occurrence percent in wetlands (i.e., 66% to 69%) that are much finer than could be supported by scientific data. Most users of the list for practical applications such as wetland delineation are likely unaware of the lack of information behind these fine-scale ratings. The decision to drop these qualifiers improves the overall quality of the NWPL.

Taxonomic Issues. Plant taxonomy is a continually evolving science. As new data are collected and new techniques are developed, the accepted view of the relationship between taxonomic entities may change such that one species may be split into two or more species, a species may be split into varieties or subspecies, two or more species may be merged into one species, etc. Therefore, there have been many taxonomic changes since the publication of the List88 and List96 NWPLs. Lichvar and Kartesz published a short document in May 2009 to explain how these changes would be handled in the updated NWPL. This document covered a variety of taxonomic issues, but spent considerable effort describing how all subspecific taxa (varieties and subspecies) would be given their own rating, including the “type” varieties. For species splits and mergers, the website provides the record for synonyms, allowing users to find the entities that they are looking for, even if the name is no longer accepted as the species name.

Following review of the R1 voting results, the NP recognized that most reviewers would not be able to knowledgeably assign wetland ratings to all of the different plant varieties included. It thus decided to drop all sub-specific taxa from the NWPL. For the vast majority of species, this is perfectly reasonable because the level of scientific knowledge is insufficient to support separate ratings for the different varieties or sub-species. However, arguably there are cases where different varieties are known to have different wetland affinities; this may especially be the case for varieties that were once separate species subsumed into one species based on morphological, genetic, and interbreeding. Because ratings are only assigned at the species level, some useful information has been lost in the process. While it is undesirable at this point to include separate ratings for all varieties of all species, a mechanism to differentiate between varieties when the regional panel members feel it is appropriate would maintain the detail available in some of these cases. This mechanism would be similar to the system used for sub-regionalization as described below.

Regionalization and Subregionalization. It was realized early in the update process that the previous regional boundaries, based on USFWS administrative regions, was inadequate for accurately assigning wetland ratings because each region contained a variety of ecological settings. Therefore, it was determined to base the ratings on ecoregions and Major Land Resource Areas (MLRA). This decision improves the overall quality of the NWPL because at the large-scale level it recognizes that some species will have different responses to wetland situations in different ecoregions. For instance a species might be found almost exclusively in wetlands when in the arid west region, but it may commonly occur in non-wetlands in a moister montane climate. The NP also recognized that a species may have a variable requirement for wetland conditions in different parts of an ecoregion, such as the southern and northern Great Plains. Therefore, a system was developed to allow RPs to define which specific species required different ratings in different sub-regions (defined by MLRAs). Although this option was not used for very many species, the ability to incorporate a finer scale of subregional differences in wetland response increases the overall quality of the NWPL.

Use of the List96 Default Ratings. The first round of voting failed to resolve a majority of species primarily because the RP members had an understandable limitation on the number of

species to which they could assign knowledge-based ratings. While the mainland regions of the U.S. each have between 2,500 and 4,000 species of plants to be rated, most reviewers would be familiar with only a fraction of these species. As a result, the large number of blanks, or a “Don’t Know” (DK) votes is not surprising. A consensus was defined as at least 3 of the 4 votes for the same rating within a RP. Therefore, it is not surprising that a first round consensus was reached only for the most common and wide-ranging species. To help alleviate this problem, the NP decided to use the List96 ratings as a surrogate vote for any missing or DK vote. The reviewers found this to be a reasonable decision because the consensus bases for the previous ratings are generally known, and the previous votes are available.

Therefore, after R1, any species that received no votes (or DK) or one vote (regardless of what that vote was) was assigned the List96 default (because it received 3 default votes) and was not considered further in the process, likewise for any species that received two votes if one was for a value different from the List96 default (e.g. it received one vote and two surrogates that were the same, and one different, hence 3 votes for consensus). If the species received two votes that were different from the List96 default, the species remained unresolved and it went to R2.

The use of the List96 values in this manner introduced some quality concerns. First, as described above, even the best professionals are intimately familiar with a relatively small subset of a regions wetland species, this was also true when the List88 and List96 were prepared, so for the more obscure species the scientific or technical bases for the earlier ratings are probably not strong. Thus where knowledge is weak, equally weak knowledge is used as a surrogate. This is especially problematic for those species that did receive votes that were different from the default, that is, a RP member stepped forward and claimed knowledge about the species, but because no one else knew enough to vote, his vote was ignored in favor of the List96 default – this would have happened even if this member were the acknowledged expert for the species. If two reviewers put forward votes that disagreed with each other, the disagreement never went to R2 because the default values overrode the dissenting vote.

The default values could have been usefully applied as a fifth vote, such that all cases where a species received two no-votes and two votes that were the same as the default would reasonably use the default value. It would not be appropriate in cases where there are four positive votes (i.e., two votes that are the same as the default along with two different votes).

For some species, use of the default may eventually be the only option if no reviewers at any stage have sufficient knowledge to assign a rating. But as applied, the use of the List96 defaults ignored the input of regional reviewers who did claim to know the species, and prevented the more obscure species from being considered by other reviewers that may have had useful information to provide, such as the R3 regional experts and Dr. Mohlenbrock.

Use of the Website Platform. The NWPL update project team made excellent use of the power of current computing technology and the internet to develop a web-based wetland plant database and project data sharing platform. The website provides transparency to the project and allows the contributors to the NWPL to receive information from the project leaders and to view votes of others. The website increases the quality of the NWPL update.

3.0 CONCLUSIONS AND RECOMMENDATIONS

General conclusions and recommendations from the reviewers are provided in the following sections.

3.1 Conclusions

The process as originally envisioned in 2007 and described in Lichvar and Minkin (2008) was technically sound and was developed to produce a transparent record of the process and a clear history and basis for the rating of each species. In general, the National Wetland Plant Panel (NP) addressed many of the fundamental issues with use of the existing and outdated lists. Stakeholders had recognized that the substantial deficiencies with the List88, while a monumental achievement in its day, have undermined its scientific underpinnings and that a new approach was necessary. The process envisioned by the NP when completed will go a long way to addressing many of these shortcomings.

The NP was motivated by a clear understanding of the issues that made the updated List process necessary, developed a good conceptual vision of how to address inadequacies in the previous lists, and executed course corrections as needed throughout the implementation of the project to ensure that goals would be achieved. The NP made a number of decisions (including use of the List96 Plant Indicators (PIs) as defaults, elimination of the +/- qualifiers, use of outside botanical experts) that demonstrated its pragmatic approach used. By making the process transparent and individual votes all available to scientific scrutiny, by bringing synonymy up to date and by providing a website, the NP's efforts clearly advanced programmatic goals.

The fundamental criticism of the List88 that the scientific basis for the assigned plant indicators (PIs) was not adequately referenced and could not be substantiated remains somewhat unaddressed by this new effort. Landscape-level habitat-specific plant frequency data are simply not available for the vast majority of taxa on the list and in some cases the data have been collected but exists only in proprietary databases. A considerable allocation of resources would be necessary to substantially improve the scientific basis for the assigned PIs. With the process and results easily accessible through the new website, parties that have an interest in challenging the proposed PIs will have a better understanding of how the proposed PIs were developed. In addition, the process for collecting the data necessary information to support a challenge to the proposed PIs will be formalized. This seems to be the most efficient (and respectful of public resources) mechanism for programmatically improving the List over time. The scientific accuracy and reliability of the List will improve as additional plant distributional data become available (independent research programs or as part of challenges to individual PIs); nonetheless, the current effort represents a substantial improvement in accessibility and transparency of information supporting the updated PIs.

3.2 Recommendations

The Battelle reviewers made a number of specific recommendations as part of the preliminary review process. First of all, it is important to complete the IEPR evaluation of the process once the public comments and votes have been received. This report is considered preliminary in that

only the preparatory steps used to revise the list were evaluated; as recognized by the legislators that promoted the IQA, the interaction with the public is a critical component that should be included in the process. Other principal recommendations that derived from the preliminary analysis include the following:

- Anticipating that there will be some challenges to the proposed ratings changes, the NP should develop guidance that specifies data requirements necessary to challenge a current wetland rating. With the substantial costs of data collection on the necessary scale, the NP should designate a process for reviewing and approving proposals before the work is done.
- Although numerous references to identifying and rectifying potential QA issues were noted in the various documents reviewed, we recommend that the existing program be described and posted on the website. Any potential shortcomings should be addressed before the list is finalized.
- Some of the explicatory material available on the website is conceptual in nature or obsolete and not particularly helpful in understanding the specific steps that were used in the update process. It would be worthwhile to prepare supplementary materials that provided specifics of what was actually done.
- The revised list of wetland indicators should be tabulated, statistically summarized and compared to earlier lists (e.g., Tiner, 2006) to help stakeholders understand regional impacts of the revised lists.
- While the update process has resulted in an exemplary improvement in transparency and accessibility of information related to the update process, there are still numerous documents, guidance materials and comments associated with the update process that are not widely available to the public and other stakeholders. With the investment in a powerful web platform, links to these materials should be added in order to improve accessibility.
- The specific decision rules (algorithms) employed during the voting cycles are not explicitly provided and it is recommended that it be addressed (link to a decision-flow diagram with a link from the website?) to improve transparency.
- The NP should consider how the relative uncertainties in the updated ratings (particularly degree of confidence) could be qualitatively or quantitatively described as an aid to interested parties interpreting their use.
- It is anticipated that the draft List will be issued in the Federal Register in early 2011 and that the remaining task elements could be completed by July or August 2011. As the task assignment could not be completed, it is recommended that an additional task assignment be issued to complete the IEPR process. It is also recommended that the major preliminary findings reported in this document be discussed with the USACE to determine how best to represent the key findings of the IEPR when the updated List is ready to be finalized.

4.0 REFERENCES

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