ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNFICIANT IMPACT FOR THE WESTERN MOUNTAINS, VALLEYS, AND COAST REGIONAL SUPPLEMENT TO THE 1987 WETLAND DELINEATION MANUAL

Purpose and Need

The purpose and need for this supplement to the 1987 Manual is to use the best available scientific and technical information for improving precision in delineating upland/wetland boundaries in the Western Mountains, Valleys, and Coast Region for purposes of Section 404 of the Clean Water Act and provide a procedure for continual future updates as more data are gathered and analyzed.

Background

The U.S. Army Corps of Engineers Wetland Delineation Manual was published in 1987 (Environmental Laboratory, 1987) and identified a three-parameter approach to delineating wetlands – hydric soils, wetland hydrology and hydrophytic plants. Use of this manual for wetland delineation by Corps Districts has been mandatory since 1991.

Since the manual was first published, the U.S. Fish & Wildlife Service (FWS) proposed updating the 1988 National Plant List and the Natural Resources Conservation Service (NRCS) has published newer versions of the "Hydric Soils of the United States". In addition, wetland science has advanced the understanding of the processes (e.g., biochemical) in these systems.

In 1993, the U.S. Congress requested that the Environmental Protection Agency (EPA) ask the National Academy of Sciences, National Research Council (NRC) to create a committee to study the scientific basis for the characterization of wetlands. The committee was asked to review and evaluate the consequences of alternative methods for wetland delineation and to summarize the scientific understanding of wetland functions (National Research Council, 1995). One of the recommendations of this committee was to develop regional supplements to the 1987 Manual and that the regions should be defined on the basis of physiography, climate, vegetation and prevailing land use and should be used by all agencies for wetland characteristics.

The Corps Engineer Research and Development Center (ERDC) was asked to identify and discuss the technical issues relevant to regionalization of the manual (Wakeley, 2002). The Corps, as the lead Federal agency and author of the 1987 Manual, invited the other three Federal agencies that assess wetlands (EPA, NRCS and FWS) to participate in the development of regional supplements, as recommended by the NRC. A National Advisory Team consisting of representatives of all four Federal agencies was created to oversee the regional supplements to provide quality control, consistency on national issues and decisions regarding the timing and defining of "regions". This regional supplement was developed by a Regional Working Group consisting of experts from Federal/state/local agencies and academia. The availability of the draft supplement was announced through the Corps public notice process for public comment

and field-testing, and underwent an independent peer review as discussed below. When finalized, the interim supplement will be implemented with additional field-testing for one year before a final version of the supplement is published by ERDC.

This document discusses the factors considered by the Corps during the development process for the Western Mountains, Valleys, and Coast Regional Supplement. This Environmental Assessment/Finding of No Significant Impact contains: (1) a discussion of the environmental consequences necessary to comply with the National Environmental Policy Act, and (2) creation of an independent peer review, their report and the Corps response to their comments as required by the Office of Management and Budget (2004).

Alternatives

We considered three alternative methods with respect to the 1987 Manual. The No Action Alternative would result in the continued use of 1987 Manual without scientific or technical changes. The preferred alternative would be to develop regional supplements that identify a regionally tailored list of indicators appropriate for that ecological region, include more helpful local photographs and descriptions and more detailed guidance on problem areas. The third alternative considered was to update and republish the 1987 Manual.

Affected Environment

This supplement is applicable to the Western Mountains, Valleys, and Coast Region, which consists of portions of 12 states, including Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming. The region contains the major western mountain ranges – the Cascade Mountains, Sierra Nevada Mountains, and Rocky Mountains – and other scattered mountain ranges where the vegetation is dominated mainly by coniferous forests at lower elevations and alpine tundra at the highest elevations. The region also embraces the Willamette/Puget lowlands, and the numerous valleys, meadows, high plateaus, and parks scattered within the mountainous areas that often support grasses, forbs, or shrubs, and includes the Coast Ranges, rain forests, and coastal zone from northern California to the Canadian border. About half of the region is in Federal ownership, mostly in national forests.

The Western Mountains, Valleys, and Coast Region surrounds and is interspersed with the Arid West Region (U.S. Army Corps of Engineers 2006) but generally receives more abundant rainfall and/or snow, has lower average temperatures, higher humidity, and lower evapotranspiration rates. Streams in the region tend to be perennial, whereas those in the Arid West are more often intermittent or ephemeral. Many of the streams and rivers that flow into and through the Arid West have their headwaters in the Western Mountains, Valleys, and Coast Region.

The coverage for this supplement is based mainly on a combination of Land Resource Regions (LRR) A and E recognized by the U. S. Department of Agriculture (USDA Natural Resources

Conservation Service 2006). Subregion boundaries used for certain indicators in this supplement correspond to LRRs. In addition, the region includes the following portions of LRRs B, C, D and G:

- Sierra Nevada Mountains (Major Land Resource Area (MLRA 22A)
- Southern Cascade Mountains (MLRA 22B)
- Arizona and New Mexico Mountains (MLRA 39)
- Black Hills (MLRA 62)
- Other mountain ranges scattered throughout the West that support mainly coniferous forests on the slopes and open coniferous woodlands, shrublands, meadows, and hardwood riparian woodlands in the valleys, down to the lower elevational limit of the ponderosa pine (*Pinus ponderosa*) zone or its local equivalent.

Areas dominated by pinyon/juniper (e.g., *Pinus monophylla* or *P. edulis* / *Juniperus* spp.) woodlands are excluded from this region and included within the Arid West Region (U.S. Army Corps of Engineers 2006). Most of the wetland indicators presented in this supplement are applicable throughout the entire Western Mountains, Valleys, and Coast Region. However, some indicators are restricted to specific subregions (i.e., LRR) or smaller areas (i.e., MLRA). The decision to use the Western Mountains, Valleys, and Coast Regional Supplement or the Arid West Regional Supplement on a particular field site should be based on landscape and site conditions, and not solely on map location. In many areas of the West, the transition between the two regions is indicated by the upper limit of pinyon/juniper and associated shrub-dominated communities, and the lower limit of ponderosa pine or other coniferous forests.

Environmental Consequences

The No Action alternative would not achieve one of the goals of the Corps, which is to use the best scientific/technical information available in the Clean Water Act Section 404 program or the purpose and need of this project. The No Action alternative would result in continued heavy use of the "problem areas" section of the manual without additional science-based guidance. Although the 1987 Manual is updated to incorporate some other technical information such as use of updated National Plant Lists and the Natural Resources Conservation Service Field Indicators of Hydric Soils, newer information such as alternative procedures for calculating plant dominance may not be used consistently. Use of the 1987 Manual with no changes would result in continued confusion and lack of clarity, predictability, precision and consistency in the region. No changes to wetland delineation methods or boundary lines would occur with this alternative.

The preferred alternative, to develop regional supplements to the 1987 Manual using the best available scientific data, is expected to result in more consistent, science-based upland/wetland boundary determinations by Federal, tribal, state and local government delineators as well as private parties. Region-specific issues such as new hydric soils indicators, if they were developed for specific technical problems, would be included in the appropriate regional supplement. Also, region-specific technical problems such as plant cover of halophytes or morphological adaptations of certain plant species can be described and photographs and

guidance will be included in each regional supplement. This results in a more user friendly and region-specific document. Also, if changes in a particular region of the country need to be made, then the entire country does not need to change versions.

Changes to this supplement would be much easier than continuous changes to a national manual. There will be some training requirements for both agency personnel and private companies as this supplement is finalized. A transition period of one year will occur when the interim document is published and additional data will be collected on perceived changes to upland/wetland boundaries based on the new supplement. Additional needed changes will be made prior to publishing a final document. It is not expected that the regional supplement will have the net effect of increasing or decreasing the total amount of wetlands in the Western Mountains, Valleys, and Coast Region, although site-specific boundary changes may occur. These changes may occur due to more refined plant indicators or the use of new soils or hydrology indicators. The testing period using the interim document will allow for further identification of the types and reasons that changes to wetland boundaries occur, prior to finalization of the document. If significant changes to wetland boundaries of specific types or in specific geographic locations occur, an analysis would be completed to determine the acreage of wetland affected and the indicator(s) responsible for the change. However, all areas must continue have all three parameters – wetland hydrology, hydric soils and hydrophytic vegetation – in order to be determined to be a wetland that may be regulated under Section 404 of the Clean Water Act.

The third alternative would be to update and republish the 1987 Manual. Some overlap in supplements is expected as they are developed from west to east and common themes may eventually develop, resulting in changes and republication of the 1987 Manual for national issues such as changes to procedures for plant dominance calculations that may be identified. However, without identifying specific technical problems by developing regional supplements, it is difficult to articulate national issues. There would be a difficulty in answering problem area questions across the country without a systematic approach to identifying technical problems and solutions. This alternative would likely take an addition 5-6 years to identify all of the national technical problems and result in continued difficulty updating a single document.

Coordination with Others

Copies of the comments received during the public comment period are attached to this document. A 60-day comment period was announced by public notice by the Western Corps Districts in or near April 20, 2007. This date is approximate, as the date of the public notices from each district do not correspond exactly with this date. Comments were received from the following individuals:

The State of Washington, Department of Ecology requested 1) more clarification of the boundary between wetlands and other aquatic resources and 2) a complete list of aggressive UPL and FACU plant species that can be found in wetlands.

Concerning the question of distinguishing wetlands from other aquatic resources: The purpose of the Supplement is to help identify wetlands as defined in the 1987 Manual and Corps regulations. The identification of other "waters of the United States" is beyond the scope of the Supplement. The purpose of the discussion on "Sparse and Patchy Vegetation" in Chapter 5 is to help clarify when an area can be considered "vegetated" for wetland purposes (i.e., if it has >5 percent plant cover). Thus, unvegetated wet areas (<5 percent plant cover) are not wetlands but may meet requirements for other regulated waters. They qualify as "other waters" if they exhibit Ordinary High Water (OHW) indicators that are described in regulations or District guidance. Figure 5-1 shows a mosaic of wetlands and other waters. The bare areas are outside the wetland but are still potentially regulated waters. Guidance in this Supplement and in the Arid West Supplement it references says that the final delineation of potentially jurisdictional habitats includes the vegetated wetland, unvegetated other waters (OHW indicators present), and other associated unvegetated areas that exhibit indicators of hydric soil and wetland hydrology (see the Interim Arid West Regional Supplement, pages 81-82; the Western Mountains working group felt that the information did not need to be repeated in the Western Mountains Supplement).

It is correct that this Supplement does not provide specific procedures for identifying the boundary between wetlands and lakes or rivers. However, those areas that pass the 3-factor test are wetlands under this Supplement. Identification of the boundaries of lakes and rivers for other federal or state programs is beyond the scope of this Supplement and probably varies from state to state. The suggested revised wording (except for the ¼-acre threshold) is already true according to the Supplement and does not need to be restated. The reason for the ¼-acre threshold is not clear and seems arbitrary.

Item 4: Concerning the suggestion to provide a complete list of aggressive, invasive FACU or UPL plants that invade wetlands: The USDA Plants database provides state lists of weedy, invasive plant species but these lists are not complete. To use the procedure in the Supplement, there should be published evidence of the species' invasive behavior. We will attempt to clarify the wording of this section.

Rozewood Environmental Services, Inc.: 1) disagrees with removing the (+) and (-) from the FAC species or update the plant list every two to three years, 2) recommends de-emphasizing "weedy" species, 3) suggests using a minimum coverage for each plant layer, and 4) the list of primary hydrology indicators is too inclusive; some should be secondary indicators.

1) The Regional Working Group was not unanimous but a clear majority favored dropping plus and minus modifiers from wetland indicator status ratings. Basically, the present system implies far too much accuracy in assigning plants to the eleven categories of wetland indicator status (i.e., OBL, FACW+, FACW, FACW-, FAC+, FAC, FAC-, FACU+, FACU, FACU-, and UPL). This system cannot be supported with existing data about plant distributions. In reality, plus and minus modifiers were often assigned to resolve differences of opinion in plant panels. Using only the five basic categories (OBL, FACW, FAC, FACU, and UPL) makes more sense with existing knowledge. We agree that plant lists should be updated regularly as new data become

available. Now that authority for the development and maintenance of the plant lists has been transferred to the Corps, a regular process of updates is planned. However, this process is separate from the development of Regional Supplements.

2) The possible spread of invasive species with FAC ratings into non-wetlands would not cause them to be mistaken for wetlands because the three-factor approach ensures that only areas with indicators of all three factors – hydric soils, wetland hydrology, and hydrophytic vegetation – would be identified as wetlands. The opposite problem seems more likely. The spread of FACU or UPL invasives into wetlands could cause them to fail a hydrophytic-vegetation determination.

3) We agree that there is little unanimity among wetland delineators about changes to the present system. The National Technical Committee for Hydrophytic Vegetation (NTCHV) considered the issue of the various thresholds used in vegetation sampling and hydrophytic-vegetation decisions, and recommended that the supplements continue to use the current system until the consequences of making a change are studied and understood. The 50/20 rule and associated guidance for determining hydrophytic vegetation were developed specifically for wetland-delineation manuals and have no previous history in the botanical literature. Therefore, the consequences of a change are not well understood. In contrast, weighted-average methods, such as the prevalence index, have a long history in the scientific literature and their characteristics are better known. The NTCHV hopes to initiate appropriate studies and encourage others to do the same before suggesting a change to the system that has been used fairly successfully for more than a decade.

Chapter 4 (Wetland Hydrology), item 1: As described in the introduction to the chapter, the role of wetland hydrology indicators is to provide evidence that an episode of flooding, ponding, or soil saturation occurred recently, but they offer little if any additional information about the timing, frequency, or duration of such episodes over a long-term record. Therefore, it is not surprising that wetland hydrology indicators are sometimes found in non-wetlands. However, these areas would not be mistaken for wetlands because the three-factor approach ensures that only areas with indicators of all three factors – hydric soils, wetland hydrology, and hydrophytic vegetation – would be identified as wetlands. The three indicators mentioned – water marks, drift deposits, and sediment deposits – were considered by the working group to be reasonably reliable indicators in this region where rainfall and snowmelt produce relatively consistent runoff and stream discharges. This is in contrast to the Arid West Region, where these indicators were given secondary status in riparian situations due to extreme temporal and spatial variability in stream flows. For these three indicators, the User Notes say to use caution when the indicators are caused by extreme, infrequent, or very brief flooding events. Therefore, if you know that the flooding event indicated by a drift line was an extreme or infrequent one, then you should not check the indicator on the data form.

The 12-inch depth for evidence of saturation is consistent with the 1987 Manual and has been used for almost twenty years in the delineation of wetlands. It is also consistent with the recommendations of the National Academy of Sciences. In any case, the observation of saturation in the upper 12 inches is, in itself, not sufficient evidence that the area is a wetland.

The three-factor approach ensures that non-wetland areas with "weak saturation" are not mistaken for wetlands. In general, there is no stronger evidence of wetland hydrology than the direct observation of flooding, ponding, or soil saturation during a site visit, taking into account the timing of the observation relative to normal rainfall patterns. Thus, they deserve to be primary indicators.

The 14-day duration standard for wetland hydrology is consistent with the recommendations of the National Academy of Sciences. In any case, most wetland decisions are based not on hydrologic measurements but on indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. If indicators are present, that is strong evidence that the timing, frequency, and duration of flooding, ponding, or saturation have been sufficient to produce wetland conditions, including anoxic soils, unique soil morphology, and a characteristic plant community.

As stated in the responses to the Peer-Review Team's report, a revision to Chapter 1 will clarify those limited parts of the 1987 Manual (e.g., lists of indicators, growing season definition) that will be replaced by this supplement. All other portions of the 1987 Manual will remain in effect. The supplement does not address "man-created wetlands" in any detail because this portion of the 1987 Manual will not change.

Independent Peer Review:

The purpose of the Office of Management and Budget Information Quality Guidelines (2004) is to enhance the quality and credibility of the government's scientific information, recognizing that different types of peer review are appropriate for different types of information. A copy may be obtained at http://www.whitehouse.gov/omb/inforeg/peer2004/peer_bulletin.pdf . The Federal agencies were granted broad discretion to weigh the benefits and costs of using a particular peer review mechanism; however, agencies strive to ensure that their peer review practices are characterized by both scientific and process integrity. Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community and involves the review of a draft product for quality by specialists in the field who were not involved in producing the draft. The peer review report is an evaluation or critique that is used by the authors of draft information that contains important scientific determinations to improve the product. The selection of participants in a peer review is based on expertise, with due consideration of independence and conflict of interest. In some cases, reviewers might recommend major changes to the draft, such as refinement of hypotheses, modifications of data collection or analysis methods, or alternative conclusions. However, the peer review does not always lead to specific modifications in the draft product. In some cases, the authors do not concur with changes suggested by one or more reviewers.

A peer review is considered completed once the agency considers and addresses the reviewers' comments and incorporated where relevant and valid. In cases where there is a public panel, the agency publishes the peer review report(s) and the agency's response to the peer review comments. Agencies prepare a written response to the peer review report explaining: the agency's agreement or disagreement, the actions the agency has undertaken or will undertake in

response to the report, and (if applicable) the reasons the agency believes those actions satisfy and key concerns or recommendations in the report. A copy of the peer review report, including the responses to the comments, is included as an attachment to this document.

Finding of No Significant Impact:

In compliance with the National Environmental Policy Act (NEPA) and its implementing regulations at 40 CFR parts 1500 – 1508, an Environmental Assessment has been prepared for this rule. The Corps prepares appropriate NEPA documentation, including Environmental Impact Statements when required, for all permit decisions. The environmental review process undertaken for this rule has led me to conclude that the publication of this supplement will not have a significant effect on the human environment, and therefore an Environmental Impact Statement is not required by §102(2)(C) of NEPA or its implementing regulations. A copy of this Environmental Assessment with attachments is available from the U.S. Army Corps of Engineers, HQUSACE, Operations and Regulatory Community of Practice, 441 G Street, NW, Washington, DC, 20314-1000 and on the Regulatory Homepage at http://www.usace.army.mil/inet/functions/cw/cecwo/reg/reg_supp.htm.

Lawrence A. Lang

for Michael G. Ensch
Chief, Operations
Directorate of Civil Works

Literature Cited

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

National Research Council (NRC). 1995. Wetlands Characteristics and Boundaries. National Academy Press (Washington, DC). 308 pp

Office of Management and Budget. 2004. Final Information Quality Bulleting for Peer Review.

U.S. Army Corps of Engineers (2006). "Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region." J.S. Wakeley, R.W. Lichvar and C.V. Noble, eds. ERDC/EL TR-06-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USDA Natural Resources Conservation Service 2006. *Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin.* Agriculture Handbook 296. Washington, DC: U.S. Department of Agriculture. (http://soils.usda.gov/survey/geography/mlra/index.html)

Wakeley, J. S. (2002). "Developing a 'Regionalized' Version of the Corps of Engineers Wetlands Delineation Manual: Issues and Recommendations," ERDC/EL TR-02-20, U.S. Army Research and Development Center, Vicksburg, MS.

SPECIAL PUBLIC NOTICE

US Army Corps of Engineers
Omaha District

DRAFT Western Mountains & Valleys Regional Supplement to the 1987 Wetland Delineation Manual

Issue Date: **April 20, 2007**
Expiration Date: **July 19, 2007**

90 Day Notice

NOTICE OF AVAILABILITY AND REQUEST FOR PUBLIC COMMENTS

The U.S. Army Corps of Engineers, Omaha District, announces the availability of the Draft Western Mountains & Valleys Regional Supplement to the 1987 Wetland Delineation Manual (Environmental Laboratory 1987). This draft was developed by regional expert delineators with input from state and Federal agencies, academia and other local experts. It is being peer reviewed by a panel of independent scientists, the report from which will be available upon request. This draft is also being field tested by interagency teams of state and Federal agencies to determine the clarity and ease of use of the document and whether its use will result in any spatial changes in wetland jurisdiction for Clean Water Act Section 404 purposes

We are specifically seeking public input, including scientific information/data, on the proposed hydrology, soils and vegetation indicators and data collection procedures in this draft document. Reviewers may wish to field test this manual as part of the public comment procedure. The protocol for this testing is to perform wetland delineations using both the 1987 Wetland Delineation Manual and this draft regional supplement on the same data points. Reviewers should include data sheets from the manual and draft supplement, maps indicating data collection points (upland and wetland) and a completed questionnaire for each delineation point. The testing protocol and questionnaire are attached and the draft may be located at:

http://www.usace.army.mil/cw/cecwo/reg/reg_supp.htm

Comments must be submitted by July 19, 2007, to Ms. Katherine Trott (CECW-CO), U.S. Army Corps of Engineers, 441 G. Street, NW, Washington DC 20314-1000 or by e-mail to 1987Manual@usace.army.mil. Another public notice will be issued by this district announcing the publication of the final supplement and the implementation date of this supplement.

Attachments

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
TTY 711 or 800-833-6388 (for the speech or hearing impaired)

July 18, 2007
Ms. Katherine Trott (CECW-CO)
U.S. Army Corps of Engineers
441 G. Street NW
Washington D.C. 20314-1000

Re: Comments on Draft Western Mountains & Valleys Regional Supplement to the 1987 Wetland Delineation Manual.

The Washington State Department of Ecology wetlands group would like to offer the following comments on the draft supplement to the delineation manual.

1. In general, the supplement provides much needed clarification on problems we have faced in delineating wetlands in the area west of the Cascade crest. We would like to commend the Corps on taking on this task.
2. The descriptions of the proposed hydrology, soils, and vegetation indicators and data collection procedures better reflect conditions in this region and will reduce some of the questions and ambiguities we have encountered with applying the 1987 manual.
3. We have found, however, that some ambiguity remains in the description of how to determine the boundary between vegetated wetlands and other aquatic resources (as opposed to the boundary between vegetated wetlands and uplands). The description and Figure 5-1 on page 86 (Sparse and Patchy Vegetation) is not clear whether the unvegetated patches should be considered as inside or outside the boundary of the vegetated wetland, and whether they should be considered as a separate "waters of the U.S." or not. The reference to the supplement to the Arid West is not very helpful because this issue is also not addressed there.

   Furthermore, neither the supplement nor the original 1987 manual provide any procedures for identifying the boundary between vegetated wetlands and the open water part of lakes, or between vegetated wetlands and the unvegetated parts of rivers. Local governments in Washington State are tasked with managing wetlands, streams, and lakes under the Growth Management Act and the Shoreline Management Act. However, local governments often have different regulations (e.g. buffers) for different aquatic resources (lakes, wetlands, rivers). It is thus important to have procedures for identifying the boundaries between them so the regulations can be applied fairly. This is important to us here in Washington because there is a law requiring the Department of Ecology to develop a method for delineating wetlands that is consistent with the ACOE method. If this ambiguity in the supplement is

not resolved it will potentially cause confusion when specific boundaries around wetlands are delineated by different users.

I would like to suggest the following clarification be added to the section on the 5% rule (suggested additional text is in italics):
"For delineation purposes, an area should be considered vegetated if there is >=5% area cover of plants. *Unvegetated aquatic resources that meet the criteria for soils and hydrology (lakes, rivers, streams, mud flats, etc.) having less than 5% cover of plants and that are larger than ¼ acre are not to be included within the delineated boundary of a "vegetated" wetland. Unvegetated areas that are less than ¼ acre in size, however, should be included within the boundary of the vegetated wetland. Sites larger than ¼ acre should be evaluated as potential non-wetland waters of the US using OHW indicators.* NOTE: the size threshold of ¼ acre is not fixed and may be set to whatever seems appropriate to the Corps and other reviewers.

4. A complete list of aggressive UPL or FACU plants species that can be found in wetlands should be provided as part of the supplement to avoid arguments among different botanists. At a minimum, criteria should be provided for identifying aggressive species. There is much room for argument if no guidance is provided on this issue. At one extreme, one could argue that any FACU plant growing in an area that has the necessary hydrology and soils should be considered as aggressive.

Thank you for considering these comments,

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July 21, 2007

ROZEWOOD
Environmental Services, Inc.

Ms. Katherine Trott (CECW-CO)
U.S. Army Corps of Engineers
441 G. Street NW
Washington DC 20314-1000

Re: Comments on Draft Interim Regional Supplement to Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region

Dear Ms. Trott and Colleagues:

I am a professional wetland scientist, a certified professional soil scientist, and geologist, with twenty years of professional experience as a field scientist, working primarily in Washington State. This letter presents comments, concerns, and endorsements that I have with the Draft Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region, that was released for peer review and field testing on April 26, 2007. I have been delineating wetlands since 1988. I am a consultant, and have a very good professional reputation with the local, state, and federal agencies in the Pacific Northwest. I will attempt to be concise with general comments, so that you can consider my points and [hopefully] incorporate them when finalizing the regional supplement document.

Section (Chapter) Two: Hydrophytic Vegetation

1. The new supplement proposes to do away with the pluses (+) and minuses (-) used with facultative, facultative upland, and facultative wetland indicator statuses, therefore, including facultative minus (FAC-) species. I am not in favor of this. However, IF you do maintain this current draft, I strongly propose that wetland indicators statuses of plants be regularly updated every two to three years. We update our hydric soil indicators. We should also update our wetland vegetation indicators regularly.
2. Some plant species are very opportunistic, and can even be "weedy" in their spread and their abilities to take advantage of varying environmental conditions. A typical example would be the legume black medic (*Medicago lupulina*), assigned a facultative (FAC) indicator status. I think weedy, invasive species should somehow be de-emphasized in the vegetation assessment procedures, especially when those species are rated as FAC. Under the present draft of the regional supplement, I feel broader and more expansive areas will qualify as "hydrophytic" vegetation, when in reality the plant community is truly showing an invasion of opportunistic species that happen to have facultative statuses. In some ways, I can see the logic of using a FAC-neutral approach when dealing with invasive facultative plant species: weighing and considering those dominant species that are wetter or drier than the "generalists" facultative (FAC) species.
3. In the field form and procedures to calculate dominance, I strongly recommend that you have a minimum percent coverage threshold above which species could qualify as dominant components, and below which species could not. This is tied to when species are counted as dominants because they make up 20% of the cover in that particular stratum. Example: In a shrub understory where shrub cover is relatively sparse or interspersed: 15% cover Shrub 1, 5% cover of Shrub 2, and 2% cover of Shrub 3. Under the 50/20 Rule, Shrub 2 would be counted as a dominant because it is 20% of the cover of that stratum. When I have applied this 50/20 rule in the past, I have stated that the species has to have a minimum coverage of at least 10% or greater to qualify. Plants that cover substantially less than that are NOT dominants, and to call them such is playing a numbers game. We are trying to accurately decipher a plant community. I do play very close attention to all associated, non-dominant species, and have used their occurrence as assisting rationales in interpreting a vegetation community. But please consider a minimum coverage threshold.

P.O. Box 238 Lopez Island, WA 98261 phone: (360) 468-4448 email: rozewood@rockisland.com

Section (Chapter) Three: Hydric Soil Indicators

1. I use the latest field indicators of hydric soils (version 6.0, 2006) drafted by the Natural Resource Conservation Services and the National Technical Committee on Hydric Soils. While it is a more intensive to use in the field compared to the old 1987 Manual hydric indicators, I feel it is the best science and set of procedures we have at this time. I am a soil scientist so I'm biased to the most recent, most thoroughly tested techniques and indicators. Given my above information, I do endorse the upgrade of hydric soil indicators presented in the new draft supplemental manual.
2. The manual should have verbiage added that says the most recent and up-to-date revisions and/or versions of *Field Indicators of Hydric Soils in the United States*, drafted by the National Technical Committee on Hydric Soils, should always take precedence and by used.

Section (Chapter) Four: Wetland Hydrology Indicators

1. I have the most reservations and concerns with this chapter. Simply stated, I feel your list of primary hydrology indicators is too inclusive, and that many of them should be assigned "secondary" labels or statuses. Water marks, sediment deposits, drift deposits are all indicators of flooding. Many times, these flood events are sporadic and do not meet wetland hydrology duration to qualify as wetland hydrology. I have seen drift deposits, watermarks, and sediment deposits on sites that were flooded five or more years ago, and these sites have NOT been flooded since, but the signs/indicators persist. These indicators should be assigned secondary indicator statuses.

2. I disagree with the primary indicators of wetland hydrology "high water table" and "saturation" anywhere within 12 inches of the soil surface. I regularly see perched water tables or thin lenses of weak saturation within the uppermost 12 inches of the soil profile, but where a majority of the upper 12 inches is still well-drained and aerated and not influential or detrimental to plant (root) growth. I have always preferred the older criteria of "saturation to the soil surface" and true inundation as the best true indicators of wetland hydrology. In Indicator A3: Saturation, I do support the verbiage that was included: "This indicator must be associated with an existing water table located immediately below the saturated zone." This is good advice. But please take note that many upland areas have shallow perched water tables and/or saturated zones where a majority of the upper 12 inches of soil is non-saturated and supports dry (or often transitional) plant species. If a depth threshold must be presented, saturation or a perched water table at 6 inches would be much more influential to plant root growth than 12 inches.

3. Capillary fringes: While not stressed in the supplement (but mentioned in the glossary), Capillary fringes are not wide; they are normally under 2 inches, with some rare exceptions. Capillarity is a specific soil physics property, and I will not go into detail here (please consult with multiple soil physicists to have them explain the science behind it). Too many wetland scientists think about the "wicking effect" of sponges and correlate that to soils. Capillarity is much more complex that "wicking". I'm a soil scientist and I still get confused and rusty on the physics behind soil water movement. I respectfully know a colleague (a soil physicist) in Olympia, Washington, that could definitely clarify this topic for you. Her name is Lisa Palazzi (360-534-0346) and she is brilliant!

4. Hydrology during the growing season: while I agree with your various techniques to define a growing season, I still think we need to perfect the duration the hydrology must be present during the growing season. I see too many areas saturated for a couple weeks at the extreme beginning of the growing season that then dry out and are very dry for 10 or 11 months out of the year. It is difficult to convince the general public that something dry in April through November is actually a wetland. I know this is not a very scientific argument, but placing a reasonable time duration that hydrology must be present during the growing season would help eliminate marginal areas that dry up rapidly earliest in the growing season.

Thank you for allowing me to present some comments and concerns and endorsements. The draft document is very professional and highly visually appealing. Your staff did a wonderful job with photographs and graphics. If you have questions with any of this material in my comment letter, or need further information, please do not hesitate to call me. I will be away from my office the week of July 23rd, 2007.

Respectfully yours,

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Arid West and Mountain-Valleys-Coast Regional Supplement Questions

(These questions were submitted to Portland District on 16 May 2007 by P. Scoles and C. Newling mainly for clarification and not necessarily as a critical review of the Arid West or Western Mountains, Valleys, and Coast supplements.)

High Priority Questions (in no particular order)

1. Is it correct that without positive indicators of hydric soil and wetland hydrology, then the prevalence test and morphological adaptations approach are not performed (even if the 50/20 dominance test fails)?

Response: Correct. Indicators 2, 3, and/or 4 are used only where indicator 1 has failed but indicators of hydric soil and wetland hydrology are present, or where indicators of hydric soil and/or wetland hydrology are missing due to site disturbance or a recognized "problem" situation.

2. Given the AW and MVC regions have vast upland areas of slopes of 0-3 percent slopes, are there other "sideboards" that should be used to prevent automatically considering terraces as suspect wetland landforms? For example, differentiating between low terraces and middle/upper terraces. A definition for low terrace may be an easy sideboard.

Response: It is not clear to what section of the supplement this question refers. In any case, the wetland determination always depends on the presence of indicators of all three wetland factors -- hydrophytic vegetation, hydric soils, and wetland hydrology. "Vast upland areas," even if flat, would never be mistaken for wetlands.

3. Is a delineator supposed to differentiate between a wetting front in the soil profile (from recent rainfall) and a single observation of saturation? If so, could they cite the precedent weather and lack of soil redox features in the soil profile as evidence that observed saturation was only a wetting front? This is particularly important to vertisols which tend to perch the wetting front for several days after rainfall. That is, vertisols often have aerobic ped interiors when the wetting front or water in the cracks is moving through the profile. Any suggestions how to not get a "false positive" observation?

Response: Hydrology indicator A3 (Saturation), in most cases, requires a water table below the saturated zone. This is intended to ensure that the wetness is due to capillary fringe and that transitory wetting fronts are not counted. However, there is no such requirement for Vertisols that perch water and do not develop a water table. In the absence of other indicators, additional site visits may be needed.

4. Are riverine sediment deposits differentiated from non-riverine sediment deposits by flooding versus ponding? What if the ponding is from an overflowing stream or runoff from a nearby impervious surface? Related question -- are either colluvial sediment deposits or sediment on alluvial fans considered positive indicators of wetland hydrology?

Response: Like the similar 1987 Manual indicator, B2 is intended to address suspended fine sediments that settle out of standing water in ponded or riverine backwater situations to form "thin layers or coatings." It does not include thick alluvial deposits such as point bars and alluvial fans, or colluvial deposits.

5. For the oxidized rhizopheres along living roots indicator, is this indicator met when more than 2 percent {distinct or prominent} occur, but the same roots are present without oxidized rhizopheres in the same horizon. That is, if 80 or 90 percent of the living roots do not have oxidized rhizospheres, how do we know that the 2 percent with rhizopheres have not just invaded pore linings that formed after a former roots died?

Response: Oxidized rhizospheres must occupy at least 2% <u>of the volume of the soil layer.</u> Other roots in that layer may occupy unlined pores. Sometimes, new roots invading old pore linings can be differentiated by the lack of any oxidized iron coatings directly on root surfaces; however, this is not a requirement for using the indicator.

6. Is a positive reaction to alpha-alpha dipyridyl during the non-growing season still considered a positive indicator for soils and/or hydrology? Any discussion about using the same type of sideboards for use of alpha-alpha dipyridyl as specified for hydric soil indicator F18?

Response: Although it is listed as a hydric soil indicator by NTCHS and repeated in the supplement, F18 is not useful for most wetland delineations due to the need for multiple site visits and narrowly prescribed weather conditions. No such "sideboards" are applied to the "Presence of Reduced Iron" wetland hydrology indicator. The presence of ferrous iron generally indicates that soil microbes are active and, therefore, occurs during the growing season.

7. For the saturation visible on aerial imagery indicator, the last line states "This indicator requires onsite verification that saturation signatures seen on photos correspond to hydric soils or other evidence of a seasonal high water table." Does this mean that a NWI map or hydric soils map (from NRCS). which does not utilize onsite verification, is not adequate as "other evidence" to qualify an area as having a positive indicator? What kind of onsite verification is anticipated that is not already a hydric soil indicator or different wetland hydrology indicator? Lastly, many areas that have a "darker patches within the field" are also effectively drained by subsurface

tiles or nearby ditching -- any suggestions for not getting a false positive on this indicator?

Response: No, NWI and soil survey mapping are not adequate evidence. The indicator mentions "differential crop management" as one form of evidence that is not a hydric soil or wetland hydrology indicator in itself. The indicator should not be used in areas that can be shown to be effectively drained. However, the mere presence of a ditch is not adequate proof of effective drainage.

8. Shallow aquitards -- do they include argillic horizons, which may be as little as 3 percent increase in clay than one of the adjacent horizons? Is any fragipan or densic layer considered an aquitard, or is root penetration evidence of the opposite? In desert areas, hardpans of silica, gypsum, and/or calcium carbonate all form in the absence of anaerobic conditions -- should these be considered a secondary indicator if the aquitard formed pedogenically under upland conditions?

Response: The Shallow Aquitard indicator (D3) is restricted to depressions and the layer must be deemed capable of perching water within 12 inches of the surface. It doesn't matter how the aquitard may have formed. A slight increase in clay, compaction, or cementation with depth should not necessarily be counted as an aquitard. Root penetration would be evidence for the absence of an aquitard. In any case, the indicator is Secondary so additional hydrology indicators are required.

9. In paragraph (e) on Page 92, the AW supplement specifies that a soil is hydric if it is ponded, flooded or has a water table within 12 inches or less from the surface for 14 consecutive days during the growing season. This seems contrary to the control sections specified in Field Indicators of Hydric Soils, especially for sandy soils where evidence of wetness is needed in the upper six inches. Has NTCHS or other groups ever generated any "fall back" definition for hydric soils?

Response: We do not understand the question. For internal consistency, the supplement uses the 12-inch depth standard suggested by the National Academy of Sciences (and used by the 1987 Manual) whenever a hydrologic standard is needed. The NTCHS technical standard for hydric soils differs.

10. On Page 94, the final sentence says "This standard is not intended (1) to overrule an indicator-based wetland determination on a site that is not disturbed or problematic, or (2) to test or validate existing or proposed wetland indicators. Why? It seems that having definitive information about water table levels in the growing season is the strongest type of proof about wetland hydrology conditions for ground water based situations. Please elaborate, if possible – this probably the most asked question.

Response: This is the recommendation of the National Advisory Team for the regionalization project. If, in the future, the NAT develops a protocol for

testing hydrology indicators, the testing standard may be different from this one, perhaps by including additional information.

11. There are several indicators used both in hydric soils and wetland hydrology sections of the supplement. Does this duplication "undermine" the concept of three independent parameters? Said differently, does the duplication essentially reduce the evaluation methodology to two parameters, instead of three. Does this duplication essentially invalidate the statement on paragraph 19 of the 1987 manual which says "Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. Positive wetland indicators of all three parameters are normally present in wetlands"? By the way, this is probably the second most asked question/issue.

Response: Actually, only "Hydrogen Sulfide Odor" is used both as a hydric soil indicator and a wetland hydrology indicator; the justification for that is given in the User Notes. In all cases, wetland hydrology indicators were carefully chosen to provide evidence of CURRENT OR RECENT flooding, ponding, or soil saturation. Thus, unlike most hydric soil indicators, wetland hydrology indicators are unlikely to be relict unless the hydrologic regime has changed very recently. Indicators of hydric soil provide evidence that the hydric soil definition has been met. Wetland hydrology indicators provide evidence of a current or ongoing wetland hydrologic regime. Indicators of hydrophytic vegetation are also required. Thus, it is incorrect to claim that the wetland determination has been reduced from three factors to two.

12. On Page 2 of the data form, was it intended to have both pore lining and root channel (they are the same pedolgic feature – different names) as locations of the redox features? Typically redox features are categorized as masses, pore linings and depletions, and locations noted as in matrix, ped faces and along pore linings.

Response: You are correct. The data form has been revised to include only "pore lining" and "matrix" as potential locations. (Ped faces are another example of pore linings.)

13. There are 4 regional manuals (some still draft), but the differences seem to be the greatest for the soils indicators, and lesser with vegetation and hydrology. Does this infer that the regional supplements are mostly clarifying the vegetation parameter and adding indicators to the hydrology parameter?

Response: Lists of hydrophytic vegetation indicators also are different between supplements, for example the "Wetland Non-Vascular Plants" indicator is used in the Western Mountains supplement but not in the Arid West supplement. In addition, various wetland hydrology indicators have been dropped, added, given a new category (primary or secondary), or given a new interpretation in different supplements compared with the 1987 Manual.

14. In the absence of definitive information, it seems that the regional supplements default to considering a parameter being met. Is this intentional? Numerous people have commented that they think this "default" approach will result in delineations taking 1 or 2 years when the circumstances are considered difficult or problematic – do you agree?

Response: The supplements point toward "wetland" only when there are multiple lines of evidence to support that determination. In typical determinations, indicators of all three factors are needed. In disturbed or problematic situations, added information (e.g., landscape position, offsite resources, etc.) are needed to make a positive wetland determination. It is true that additional visits may be needed in particularly difficult situations and these may result in delayed decisions in unusual cases. It is up to the District to determine the time frame within which a decision must be made.

15. Given the breadth of new indicators/approaches and level of detail needed, we are finding it extremely difficult to get new delineators trained in only one week. Has any discussion occurred on a different format that spans about seven days (it takes about 2 days longer to get newbies to understand the prevalence index, the nuances of field indicators of hydric soil and the variations of the new hydrology indicators)?

Response: We agree that additional training (beyond the standard 5-day course) is very valuable in applying these supplements accurately. However, appropriate classes (e.g., advanced hydric soils training) have been available for years to both agency personnel and private practitioners. The Corps is relying on private vendors of wetland delineation training to fill any gaps.

Low Priority Questions

16. For the growing season "alternatives" on page 54, should these be relied upon if the ambient temperatures are unusually warm for a given year? If so, how would this be determined (especially in light of climatic change predictions/models)?

Response: The supplements incorporate site-specific and year-specific determinations of growing season dates based on direct observation in the field. A warm year will likely have an early growing season. A cool year will have a later growing season. This system allows for climate change by focusing on current conditions and not historical climate records.

17. Just curious, is the temperature of 41 degrees F at 12 inches correlated with air temperature of the growing season "alternatives"? Asked differently, why 41 degrees F at 12 inches instead of 19.7 inches?

Response: Nearly all of the evidence we compile to support a wetland determination is based on conditions in the upper 12 inches of the soil. For consistency, the soil temperature alternative is the same.

18. Is it possible to determine if water marks, especially on rocks in vernal pools, are relict? Said differently, how do we know if water marks are contemporary or relict?

Response: Water marks should be assumed to be contemporary unless there is other evidence of recent wetland drainage. In the case of vernal pools, effective drainage should be obvious (e.g., deep ripping, surface ditching).

19. For the drainage patterns indicator, unidirectional flattened vegetation occurs on uplands (due to wind and sheet flow after large rain events) and also after snow storms or rapid snow melt. Any suggestions for not getting a "false positive" on this indicator?

Response: We agree that false-positive wetland hydrology determinations can occur. That is why indicators of all three factors are required to call the area a wetland. Note the cautions given for indicator B10 and the general discussion at the bottom of page 52 (peer-review draft). Furthermore, the indicator is "Secondary" and requires at least one more secondary indicator to conclude that wetland hydrology is present.

20. In a drought situation, if the plants are identifiable and are non-hydrophytes and there is no other evidence of hydrophytes, is it still considered a problematic situation?

Response: On such a site, an experienced delineator would consider other questions as well, such as are the plants perennials? Or are they annuals that seeded themselves in a wetland during a drought period? These situations should be considered "problematic" so that other evidence can be considered to help clarify the determination.

21. Is it possible to have reference areas for vegetation under drought conditions? Won't all areas be affected equally by a drought? Ditto for the hydrology parameter.

Response: Correct. For a reference area to be useful, it should undergo the same changes seen on the "unknown" site. However, detailed long-term hydrologic information is required for reference sites, so their wetland status is known.

22. Can simple, garden-variety types of soil pH tests be used? These tests typically round up or down to the nearest 0.5 pH.

Response: Yes.

23. When using the supplement for a linear project (highway, pipeline) that criss-crosses different regional habitat areas (for example, forest and non-forest), should a consultant make a decision to use only one supplement, or use the AW supplement for non-forest and MVC supplement for forest areas?

Response: The answer depends on the scale of the project. A very long road may indeed extend from arid desert areas into wet montane forests where different supplements will be needed. However, note that "non-forest" areas do not necessarily require use of the Arid West supplement. The Western Mountains, Valleys, and Coast supplement covers grasslands, meadows, shrublands, etc., that are at the same elevations and have the same general climatic conditions as "forest" habitats in the area.

24. For surface irrigated areas, is it appropriate for a delineator to have the property owner "turn off" the irrigation water for a week to a month {or longer like 2 years} in advance of the field work to assure that a positive indicator is not recorded for irrigation-induced hydrology? This becomes a greater dilemma for areas that are subsurface irrigated because the water table is "managed" to make it closer to the surface than would naturally occur in summer months.

Response: In general, areas that have water near the surface only because of irrigation or water-table management are not regulated wetlands. Check with the appropriate Corps District for advice on making wetland determinations in irrigated areas.

25. Similarly, is a dry season water table (indicator C2) a positive indicator if it is known an area is irrigated, especially if the soils have an argillic horizon? Also, is the "vigor and stress responses" problematic situation reliable if the area is irrigated?

Response: Nothing in these supplements is intended to change Corps regulatory policy with regard to irrigated areas. Check with the local District for advice.

26. Has anyone ever compiled a list of morphological adaptations by genus (or species)?

Response: Not that we know.

27. Are certain types of FACU-dominated plant communities (genus or species) anticipated for that problematic situation, or can it be any FACU plant community? Said differently, is a plant community hydrophytic automatically if wetland hydrology and hydric soils are present, as per no. 3 on Page 86 of the AW supplement?

Response: Yes. These procedures are similar to those given as hydrophytic vegetation indicators in the 1987 Manual (e.g., "Visual observation of plant species growing in areas of prolonged inundation and/or saturation"). However, by making these part of the problem areas procedure, the supplements require additional evidence of wet conditions, including indicators of hydric soil, wetland hydrology, and an appropriate landscape position.

28. The stratified layers indicator for hydric soils (A5) seems like a good indicator for the MVC area. Any discussion of including it as a problem area for MVC?

Response: Proposals to expand the area of application of hydric soil indicators should be addressed to the National Technical Committee for Hydric Soils.

29. The concept of red parent material was historically focused on parent materials that did not normally change red colors when saturated and reduced. The test indicator (TF2) for red parent material does not indicate this -- it just requires 7.5YR or redder. If a soil with 7.5YR or redder hue easily shows a depleted matrix under wet conditions and none under dry conditions, then is this indicator invalid? Maybe this test indicator should require 60 percent of matrix be depleted if the red color matrix reacts to reduced conditions or maybe the redox requirement should be bumped up if the red color matrix doesn't react to reduced conditions?

Response: If a red wetland soil meets F3 (Depleted Matrix) then indicator TF2 would not be needed. Proposals to change an indicator should be addressed to the NTCHS.

30. If the hydrology observation of ponding, high water table, saturation cracking/crusting and algal material are only observed in areas of tire ruts or similar compacted areas (and not on adjacent ground), then can these indicators be ignored or discounted as misleading? Slightly different question: If tire ruts meet all three parameters, but the adjacent ground doesn't, are the tire ruts wetlands?

Response: Just as with the 1987 Manual, application of the supplements requires common sense and good professional judgment. No District would exert jurisdiction over tire ruts if the adjacent areas were non-wetlands.

31. Is there a way to differentiate biotic crusts associated with uplands (like on mounds separating vernal pools, or very shallow soils) from biotic crusts associated with wetlands?

Response: Yes. Upland biotic crusts are widespread in arid areas. However, they usually produce rough surfaces that do not crack, curl, or exhibit the layering typically seen in wetland biotic crusts. Wetland crusts are usually smooth, they often crack and curl upon drying, and are often associated with mud cracks and other evidence of ponding.

32. Has anyone used NRCS "hydrology tools" before for a wetland delineation? If so, are there some examples?

Response: The NRCS "hydrology tools" consists of seven tools that have been used by both NRCS and the Corps to help identify wetlands in agricultural areas. However, they are used in the eastern part of the country more than in the West. We are particularly aware of the use of scope-and-effect equations

for ditches and drains, and evaluation of wetness signatures on aerial photography, in problematic wetland determinations.

33. On Page 1 of the data form, if a site normally has low rainfall in summer, and the water year is experiencing a drought, how is one supposed to fill-in the blank about climatic conditions typical for this time of year?

Response: If the region is in the normal dry season of an otherwise typical rainfall year, then check the "Yes" box for typical conditions. However, if the region is known to be affected by drought, check "No" and explain. This observation might affect the interpretation of certain indicators and the use of certain "problem" procedures.

34. On Page 2 of the data form, was it deliberate to omit a column for soil horizon designation (such as "A" or "Bt" or "C")?

Response: Yes. To the extent possible, we have reduced the amount of soils technical jargon in these supplements. To use the indicators, it is not necessary to know whether a horizon is an A, B, or C. It is only necessary to determine whether the soil meets the color and depth requirements stated in the indicator.