

Wetland Delineation Report Guidance
Oregon Department of State Lands
Portland District Corps of Engineers
U.S. Environmental Protection Agency, Region 10
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I. Introduction

This guidance document is intended to explain agency regulations pertaining to preparing and submitting wetland determination or delineation reports (hereafter called WD Reports) for purposes of obtaining a jurisdictional determination (JD) and/or permit from either the Department of State Lands (DSL) or the Portland District Corps of Engineers (COE). DSL administers the state Removal-Fill Law and the COE administers Section 404 of the federal Clean Water Act. Wetland determinations and delineations may also be needed for other Clean Water Act programs administered by the U.S. Environmental Protection Agency (EPA). This guidance addresses pertinent existing laws and rules, compares state and federal processes, provides additional explanation of methods, criteria and indicators in the 1987 *Corps of Engineers Wetland Delineation Manual* (hereafter called The Manual), and provides practical tips for frequently encountered problems and for complying with agency regulations. It explains agency practice, but does not take the place of or override regulations. The reader is cautioned to consult agency regulations first, and to rely on this guidance only as a guide to understanding those regulations.

II. Agency Processes

A. Department of State Lands

DSL encourages submittal of WD Reports well in advance of a permit application. Early review and approval of WD Reports allows development and site plans to be made with greater assurance that wetland impacts have been minimized and that the wetland boundaries (if any) on the site will not need to be changed late in the permit application process. It is extremely helpful to have an already-approved WD Report in hand at the time of a pre-application conference with agency staff. DSL wetlands staff also review many WD Reports upon request when no state permit application is anticipated; these reports necessarily receive lower priority.

As required by law, DSL adopted rules to implement permit processing timelines. If a WD Report is required, the report must be submitted as part of a complete individual permit application, but the report does not need to be pre-approved by DSL. The WD Report will be reviewed in advance of or concurrent with the rest of the application. However, certain General Authorizations require that a WD report be pre-approved by DSL before the application can be deemed complete.

DSL adopted detailed rules on jurisdictional determinations and WD Reports that were effective July 1, 2001. These rules (OAR 141-090-0005 to 0055) set specific requirements for field procedures and reports. The rules also set up an informal process for a “request for reconsideration” of an agency JD that will be followed before (or in lieu of) a contested case

proceeding. These DSL rules do not conflict with COE procedures and requirements. Both DSL and the COE have a five year expiration of WD Report approvals; the DSL rules outline an expedited procedure for renewing expired JDs.

B. Corps of Engineers

Although WD Reports may be sent to DSL prior to application submittal, the COE adopted procedures (November 23, 1999 Public Notice on Wetland Delineation Prioritization and Procedure Processes) which generally requires submittal of a WD Report, if needed, along with an application for a permit.

III. Report Contents and Format

Report content requirements are specified in detail in the DSL WD Report rules in OAR 141-090-0035 (Appendix A). The rules specify required report sections, maps, map elements, and supporting information. The discussion below addresses selected topics. Please refer to the rules for the complete requirements

- 1. Site Location**—The location of the site must be shown on all required maps, including a general location map, National Wetlands Inventory (NWI) map, and soil survey map. Please show the site location as precisely as possible, rather than a large circle or an arrow pointing to a general location (See example, Appendix B).
- 2. Study Area**—The study area (area investigated) must be clearly identified on the wetland delineation map. It is important that when the agencies approve a delineation, it is clear to any end user what area was reviewed and approved. DSL rules require that a tax map be included in the report. If the study area is one or more complete tax lots, the delineation map should show those same parcel boundaries. If the entire tax lot is not investigated, the delineation map must clearly show the portion of the lot that was investigated with respect to the entire lot. The study area investigated can be indicated with a line and label that doesn't interfere with other information on the map. (See example, Appendix B.)
- 3. Site Description**—The site description should help the agency reviewer visualize the site and conditions and interpret the detailed data in the report. Information that is the most helpful includes: recent and current land uses; specific alterations on adjacent properties that may affect site conditions; approximate wetland extent on adjacent parcels; irrigation practices and timing; existing surface and/or subsurface drainage systems; slope and direction of water flow; and original purpose and current use of constructed ponds. Detailed topographic maps, aerial photos and site color photos are all very helpful.
- 4. Site-specific Methods**—The DSL rules require a discussion of the actual, site-specific methods used to (a) evaluate the parcel/study area, (b) determine the sampling method, (c) collect the data, and (d) determine the wetland boundaries. We are not asking for a recitation of methods from the manual; for example, it is not useful to us if the report says the wetland boundary was based upon soils, vegetation and hydrology. In contrast, as an example, it *is* helpful to tell us that the boundary was located where there was a small

topographic change corresponding to a marked decrease in *Deschampsia cespitosa* and presence of *Dactylis glomerata*. Likewise, it is not helpful if the Methods section of the WD Report includes basic manual procedures (like plot sizes or depth of soil pits) if that is not what was actually done. We need to know how you selected your plot locations, why you needed only one plot in a particular large area, why you dug your soil pit in Area B to only 6 inches (there can be good reasons!), if your actual plot size was a “plotless” entire plant community or a meter square sampling frame. Do not provide boiler plate information that is not actually correct for the particular site/determination. See Appendix C for examples of effective use of photographs to “describe” the wetland boundary.

5. **Map Legibility**—Agency review can be significantly slowed by poor map legibility. All location maps, USGS quad maps, NWI maps, soil survey maps and delineation maps must be clear. Review is slowed if we must look up and copy better maps ourselves. Review is slower yet if we must request better maps from the consultant. All features on the wetland delineation map must be clear, unambiguous and legible. Sample plot locations and numbers must be on the delineation map, not on a separate map. The same materials should be sent to DSL and the COE (i.e., not an original color copy to DSL and a black and white photocopy to the COE).
6. **NWI and Soils Maps**—It is now commonplace to include downloaded or CAD versions of NWI and soils maps in WD Reports. This is convenient for consulting firms, but has created some problems for agency reviewers. Often, the submitted NWI map does not include all waters on the original map (linears as well as polygons) and/or classification codes are missing. Usually, the topographic base map is not included. Color-coded or patterned CAD versions of soils maps often obscure the photo base (if any), generally necessitating that agency staff look up the original map. We have also found that many of these products that have been submitted with WD Reports have major errors and omissions. We much prefer to see good quality photocopies or good quality scanned reproductions of actual NWI and soil survey maps. Original soil survey base maps include numerous tiny drainages that are important to be aware of prior to conducting field work. If maps from a website or CAD versions are used and included, be certain that they are correct, complete and legible.
7. **Delineation Map Accuracy Statements**—DSL rules require that the report text and the delineation map include a statement of estimated wetland delineation map accuracy. The reason for this requirement is that, depending on the methods used, some maps are very precise and others are very general (see more discussion on page 8—Determining desired map accuracy). Neither DSL nor the COE require a professional land survey for every wetland delineation because the level of accuracy necessary varies with the site and situation. However, the accuracy estimate you provide may be reflected in our concurrence letter and advice to the applicant regarding permit requirements. The main variable is how the wetland boundaries marked in the field were transferred to the delineation map. For example, we need to know if the boundaries were measured with a tape and compass and the measurements transferred to a base map, or whether the wetland boundary was flagged in the field and professionally land surveyed (the most

accurate method). If a GPS was used, the DSL rules require the post processing accuracy of the resulting map be included, not the capability of the unit under average or optimum conditions. If the map base is a surveyed map but the wetland boundaries were not surveyed (i.e., hand drawn onto the base map), that must be made clear in the WD Report and on the map. If the wetland boundaries and plot locations were professionally land surveyed, so note in the report (including surveyor's name) and include the surveyor's stamp or name on the wetland delineation map. No other map accuracy statement is required.

8. ***Surveyed Delineation Maps***—If you are flagging a wetland boundary that will be surveyed, number all flags and use a different color flag for the sample plots. Because surveyors shoot a straight line from point to point, be sure to place sufficient flags along the wetland boundaries to ensure that the survey will adequately capture the boundary. It is extremely helpful for the delineator to be on site as the survey is done. Remember to do a final check on professionally land surveyed maps to make sure that:
 - The wetland boundaries are correct and all sample plots are included;
 - The map, including plot numbers (at the scale provided in the WD Report), is legible;
 - All map elements required in DSL's rules are on the map, including the study area boundary (often missing); and
 - The surveyor's stamp or name is on the map.

9. ***Other Waters of the U.S. and State***—Even though The Manual focuses on wetlands, other Waters of the U.S and State must also be identified and included in a WD Report and their jurisdictional boundaries included on all wetland delineation maps. For the most part, the jurisdictional boundaries of these waters will be the same for the COE and DSL. Generally, state and federal jurisdiction is to the ordinary high water (OHW) line of all streams, ponds, ditches, lakes etc. or to the upper edge of adjacent wetlands, whichever is higher. Often, it is important to do a wetland determination on these features as well. For example, a certain intermittent stream may not fall under state jurisdiction as a stream, but it might as a wetland. Similarly, some artificially created waters may be subject to COE and/or DSL jurisdiction. Consult appropriate agency staff, as needed. Wetlands that occur only within the OHW line of a stream or other Water of the U.S./State may also cause confusion. In most instances, incidental amounts of wetland entirely within OHW do not need to be separately delineated.

10. ***Wetland functional assessment***—A functional assessment is not normally included in a WD Report. The functional assessment should be submitted with a permit application. See DSL removal-fill rules for pertinent state requirements (OAR 141-085-0121 & 0126).

11. ***WD Report Results and Conclusions***—This section should summarize your conclusions, referring to previous report sections, data forms, any aerial photographs and other information as appropriate. It should contain:
 - Conclusions on whether or not (and why) various areas meet wetland criteria. This should be briefly stated, without repetition from data forms or other sections. The “why” is only pertinent for atypical or problem situations.

- Conclusions about whether or not there are other waters of the U.S. or State on or adjacent to the area investigated.
- Information the agencies need to make a JD and advise the applicant/landowner about permit requirements. This requires a good working knowledge of both state and federal regulations. For example, DSL and/or the COE may need to know or determine:
 - Is the stream intermittent and, if so, are fish present or is it a direct tributary to a fish bearing stream? If it is intermittent, does it meet wetland criteria?
 - Does the wetland have a surface water connection to a ditch or stream or is it adjacent to such features? How close is the wetland to the nearest surface drainage feature?
 - Where is the ordinary high water mark (OHW) of the stream? Are all wetlands on the site entirely below the OHW mark or are they also above it?
 - If there is a ditch on the site, was it constructed from upland or within a wetland? Is it a ditched and rerouted creek? Does it carry water to a stream?
 - If there is a pond, is it created entirely from an upland location or has it been excavated entirely or partly within a wetland or stream? What information was relied upon to determine it is artificially created? How big is it? What was its original purpose?

If you are unsure what information is pertinent in a given situation, please phone the appropriate agency staff for guidance.

- Avoid statements about why DSL or the COE should or should not regulate mapped waters; provide all pertinent information and note that the agencies will make that determination.

IV. Documents

A. Required Technical Documents

1. The primary document for wetland delineations is the *Corps of Engineers Wetlands Delineation Manual*, 1987. Use the “online edition,” which includes Regulatory Guidance Letters and other official changes and updates to the manual. The online edition is at <http://www.saj.usace.army.mil/permit/documents/87manual.pdf>
2. *Administrative Rules for Wetland Delineation Report Requirements and for Jurisdictional Determinations for the Purpose of Regulating Fill and Removal within Waters of the State* (0AR 141-090-0005 to 0055) (state only).
3. U.S. Fish and Wildlife Service *List of Plants that Occur in Wetlands*, 1988 and 1993 supplement. Note that the 1996 list has not been approved for use by the COE; thus, both the COE and DSL use the 1988/1993 list. Reference to the 1996 (AKA 1998) list plant status or use of adjacent regional lists (such as the California list in Southern Oregon) may be appropriate on a case-by-case basis with prior approval from the COE and DSL. The lists are available at either <http://wetlands.fws.gov/plants.htm> or https://www.nwp.usace.army.mil/op/g/res_agency/Wetlands.htm

4. County soil surveys and county lists of hydric soils.
http://www.or.nrcs.usda.gov/pnw_soil/mo1_reports.html
5. National Technical Committee on Hydric Soils hydric soils definition and criteria.
<http://soils.usda.gov/use/hydric>
6. NWI and LWI Maps. NWI maps or, where available, LWI maps should be consulted prior to conducting field work. These maps, along with the soil survey map, provide useful information for planning the field work. In addition, the DSL rules require that any major discrepancies between the LWI map and the delineation results be explained and supported by field data (unless, for example, the explanation is that the LWI-mapped wetland is now a factory).
7. *National Food Security Act Manual*, Third Addition, With Current Amendment (Now Amendment 5, September 2000). Document used by the NRCS and referred to by the COE in making wetland delineations on agricultural lands for agricultural activities.
http://policy.nrcs.usda.gov/scripts/lpsiis.dll/M/M_180.htm
8. Federal Operating Procedures for Completing Wetland Delineations/Determinations on Agricultural Land. Refer to the February 25, 2005 Joint COE/NRCS Guidance that outlines the responsible federal agency for completing wetland delineations/determinations on agricultural land.
http://www.usace.army.mil/inet/functions/cw/cecwo/reg/COE_NRCS_wetland.pdf
In addition, a new COE Regulatory Guidance Letter (RGL), developed in conjunction with the EPA and NRCS, is anticipated in the near future. That RGL will provide guidance regarding Section 404 of the Clean Water Act jurisdiction of prior-converted cropland that changes from agriculture to non-agricultural land.

B. Other Technical and Guidance Documents

1. *Field Indicators of Hydric Soils in the United States* (version 5.01, May 2002, Revised March 2003), published by the NRCS, is an excellent reference but its use is not required and it has not been officially adopted as stand-alone indicators of hydric soils, except as noted below. The current version of *Field Indicators* includes a correlation table identifying like indicators in the NRCS list and The Manual. NRCS indicators that can be correlated with indicators of hydric soils in The Manual may be noted as “other” or “supplemental” indicators and explained in the comments section of the data form as corroborating evidence. The User Note following Part 45c. of The Manual does, however, allow the use of the NRCS indicators for problem soils utilizing procedures in the Problem Area section of The Manual. *Field Indicators of Hydric Soils in the United States* is now updated only through Technical Notes published at the following site:
ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/FieldIndicators_v5_01.pdf
2. Hints for Conducting Wetland Determinations on Cropped Land (Appendix D).

3. *Precipitation Data*

Precipitation data from the weather station nearest the site for the weeks prior to onsite data collection may be obtained from any reliable source. In order to evaluate whether or not recent precipitation falls within a “normal range,” the standard method is to consult the WETS tables for the nearest weather station (See Additional Information Sources and Appendix E). “Mom & Pop” rain gauge data is not generally considered to be reliable, although this may be the only information available for a particular site. Hydrology data is discussed in more detail below.

4. *Floras*

There are numerous statewide and regional floras—too numerous to list. Hitchcock’s *Vascular Plants of the Pacific Northwest* is the primary source for much of Oregon, especially west of the Cascades. Floras from adjacent regions are appropriate in some areas; for example, the updated *The Jepson Manual – Higher Plants of California* is useful, particularly in Southwest Oregon south of Cottage Grove, and *Vascular Plants of the Intermountain West* (Holmgren, Reveal & Holmgren, 1984) as a supplement for areas east of the Cascades. Local floras may also be available, such as *Plant Associations of the Oregon Dunes National Recreation Area* published by the U.S. Forest Service. Be aware that most local or photo-based plant identification books are not comprehensive and sole reliance upon them could result in incorrect plant identification.

V. **Methods**

A. *Field Sampling Guidance*

The Manual includes three basic sampling protocols and guidance on how to sample sites and determine the upland/wetland boundary. Most practitioners find that plots placed along transects aligned perpendicular to the gradient/slope—a method emphasized in The Manual—is not particularly useful except for ensuring adequate reconnaissance of very large sites. There is a lot of latitude for the practitioner to determine the best methods to use for the site and the purpose (see discussion of BPJ, page 23). COE training materials emphasize that “investigators must use their experience and good judgment in adapting the sampling protocol to the site.” After conducting the offsite research it is important to walk the entire site, observing subtle changes in topography, vegetation, land alterations and so forth. From that reconnaissance, determine the field sampling approach. Oftentimes, large portions of a site can be omitted from sampling because they are “obvious upland” (e.g., a convex hill). Focus instead on suspicious areas and on adequately defining the wetland boundaries.

Generally, data must be provided for all wetlands and all wetland boundaries (see Paired Plots, below). However, there are situations—such as intricate wetland/upland mosaics, discussed below, or long pipeline or road projects—where less intensive or alternate sampling methods may be acceptable (OAR 141-090-0035(20)); consult with agency staff before committing to an unusual approach. As noted above, describe these site-specific sampling methods in your report.

1. **Plot Placement**—The Manual provides guidance on plot sizes for different strata. However, it is only guidance; it is critical to use a plot size and configuration that fits your site and your objective. The delineator must strive to have each plot be representative of a single

plant community with uniform topographic position, soil and hydrology characteristics. A plot should never overlap different elevations. For example, if you are sampling in a 4-foot wide swale, the recommended 5-foot radius herbaceous plot will not work. Instead, use more small plots or a longer, narrower plot. Likewise, if you are homing in on the wetland/upland boundary with paired plots located close together, small plot sizes are necessary.

2. **Paired Plots**—Many delineations submitted to the agencies do not have a sufficient number of paired plots to support the mapped wetland boundary. Some have none at all. Generally, all sides of a wetland within the study area require paired plots. (See Appendix F.) Irregular, wavy boundaries generally require more paired plots than less convoluted boundaries. Also, the paired plots must be located close enough together to support the placement of the wetland boundary (for example, 4-5 feet apart). If the plots are 30 feet apart, the boundary may have at least a 30-foot margin of error before factoring in mapping error. The only exception that will not cause a rejection or a delay in receiving approval of a WD Report is if the methods section adequately explains why only one (or few) set of paired plots was needed—for example, there is an abrupt topographic break that runs the entire length of the wetland/upland boundary.
3. **Determining desired map accuracy**—Map accuracy is a function of how detailed and accurate the field work is, how clear the wetland/upland boundary is in the field (problems include broad transition zones and complicated upland/wetland mosaics), and how the boundaries are marked and transferred to the wetland delineation map. As noted earlier, there is no one-size-fits-all required level of accuracy for all WD Reports. What is needed for a planned unit development site with several wetlands is quite different from what is needed by a homeowner wanting to locate a woodworking shop behind their house. For the latter, a tape measure may be entirely sufficient. The most accurate mapping method is to flag or stake the boundaries and plots in the field (with a sufficient number of numbered flags) and have them (and the parcel boundaries) professionally land surveyed. This is the best method for most development sites. A survey or mapping grade GPS may also be used. For most permit purposes, pacing or drawing approximate boundaries on an aerial photo will not provide the needed accuracy. Whatever the method, it must provide enough accuracy that the wetland boundary can be readily relocated for agency review or by the landowner, buyer or developer.

B. Upland/Wetland Mosaics

Sites that include an intricate mosaic of wetland and upland conditions can present problems of practicability. Sometimes, it is neither necessary nor cost-effective to attempt to delineate each and every upland and wetland patch within the area. All or part of a site or wetland may be a wetland/upland mosaic; **any areas that can readily be delineated in a standard fashion, generally should be**. Consult with pertinent agency personnel before deciding to handle an area as a mosaic in a wetland delineation or permit application. First, make sure that the upland areas really are upland, not normal features of certain wetland types, such as:

- Forested wetlands with upland plants growing on downed wood or from mounded soil around the base of large tree trunks;

- Prairie wetlands or wet meadows with characteristic hummocks or tussocks formed by herbaceous vegetation (e.g., *Deschampsia cespitosa*) with more upland species rooted on the hummocks; or
- A single FACU or U plant growing from a small mound (if any) and spreading out to cover a fairly large areas (e.g., *Rubus discolor*).

If the mosaic area will not be impacted by a proposed development or other alteration, map and label it as a wetland/upland mosaic. If the area will or may be subject to impacts requiring a permit: (a) obtain agency approval for your mosaic approach; (b) determine the upland/wetland ratio; (c) use that ratio for calculating permit impacts and compensatory mitigation requirements.

Example Sampling Approach for Mosaics—If there are distinctly different plant community complexes within the mosaic that have a significantly different wetland/upland ratio, sample those areas separately with clearly distinguished and mapped study areas. This is particularly important for large mosaic areas where minimization of wetland impacts is facilitated if one study area is 70% wetland but another is 40% wetland. Collect full sample plot data (soils, hydrology, vegetation) from at least two plots (more if data is ambivalent) that best represent each plant community in each study area. For example, if one mosaic study area contains *Deschampsia cespitosa* dominated wetland and *Dactylis glomerata* dominated upland, obtain data from two plots within each of those areas. Then, sample the study area using an unbiased method and make the wetland or non-wetland determination at each sample point based upon comparison of the vegetation with your reference plots. If you encounter another plant community while sampling, collect reference plot data as described above to determine if it is an upland or wetland plant community, and continue sampling. A good approach is to sample each study area using a point-intercept method at frequent, regular intervals along transects; record the plant community (e.g., *Deschampsia* or *Dactylis*) at each point. The number of transects and points needed to obtain an accurate sample depends on the size and complexity of the site. You will also need to determine the size of each study area in order to calculate the area of wetland and area of upland within each study area. See Appendix L.

VI. Technical Information

A. Technical Guidelines

Technical Guidelines for determining wetlands, deepwater aquatic habitats and non-wetlands are located in Part II of The Manual. Part II contains the definitions and describes the “diagnostic environmental characteristics” of the above three habitats. Manual users should become familiar with this part of The Manual in order to correctly identify deepwater aquatic habitats as well as vegetated shallows (see footnote 3 at the end of section 27a of The Manual.).

B. Criteria vs. Indicators

The glossary (Appendix A) of The Manual has the following definitions for the terms criteria and indicator:

Criteria—Standards, rules, or tests on which a judgment or decision may be based.

Indicator—As used in this manual, an event, entity or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in determining whether or not certain stated circumstances exist.

Although The Manual does not explicitly specify the criteria for the vegetation or hydrology parameters, the COE and EPA interpret the opening few paragraphs of those parameters' descriptions in The Manual as constituting the criteria:

Vegetation Criteria—Hydrophytic vegetation is present in an area when the plant community is dominated by species that can tolerate long periods of inundation or soil saturation during the growing season.

Hydrology Criteria—Wetland hydrology is present in an area if it is flooded regularly by tides or is regularly inundated or saturated at or near the surface for long periods during the growing season.

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Soil Conservation Service, 1994).

Hydric Soil Criteria—The Manual specifies (User Note at the end of part 37) that the hydric soil criteria published in the 1987 manual is obsolete and that the current criteria is available from the NRCS web page (see <http://soils.usda.gov/use/hydric/>).

Part III of The Manual presents the “Characteristics and Indicators” that may be used to determine if the diagnostic criteria for hydrophytic vegetation, hydric soils and wetland hydrology are met. There are a number of indicators presented for each parameter (vegetation, soil, hydrology); their relative reliability is sometimes given.

C. Hydrology Guidance

As The Manual notes, hydrology can be the trickiest wetland characteristic to assess. This is especially true in the Western U.S. Fundamentally, a site must be wet long enough to meet the wetland definition. Duration estimates provided in The Manual were obtained from data for riverine, forested wetlands in the southeastern U.S. From that data, the general “rule” (see User Notes in The Manual) is that an area has wetland hydrology if it is inundated or saturated to the surface continually for at least 5% of the growing season in most years. Rarely, of course, do we actually monitor hydrology through one season, much less for several seasons. Best professional judgment (BPJ) is essential. The discussion below addresses a few common confusions and problems.

1. Depth of Saturation—The Manual indicates that to meet hydrology characteristics, an area must be inundated or saturated to the surface at some time during the growing season of the prevalent vegetation (part 26b.(3)). Generally, “saturated to the surface” means within the top 12 inches of the soil profile—an area where the major part (more than one half of plant roots occur) of the prevalent vegetation’s root zone is located. Note also that the saturation zone is generally very close to the depth of the apparent water table in a pit.

Although it is not a hydrology indicator, soil morphology and depth of redoximorphic features is often the only evidence available for determining depth of saturation, unless one is conducting field work at the most opportune time. The presence of oxidized rhizospheres is a helpful indicator of saturation, particularly for herbaceous wetlands, although extreme care and a magnifying glass must be used in completing this evaluation.

2. **Hydrology Monitoring**—Monitoring is rarely necessary and is generally avoided due to the timing problems and cost. Often, two or three repeat site visits to check previous soil pits and dig new ones will suffice. If more intensive monitoring is needed or desired, there are technical documents that describe how to build, install and read/interpret data from monitoring wells or piezometers. Keep in mind that many wetlands have a perched water table over a fairly shallow, poorly permeable soil layer; sometimes it may be dry below that layer.
3. **Precipitation Data**—Clearly, it is important to know and consider the antecedent precipitation when conducting field work. Consider decade-level periods of drought or unusually high precipitation; precipitation for the previous 3-4 months; and precipitation during the previous 4-6 days or so. Use data from the weather station nearest to the site. When interpreting whether the field indicators and precipitation reflect “normal” conditions, refer to the WETS tables (see Additional Information Sources). The WETS tables provide long term, monthly and annual data for weather stations throughout the U.S. It is considered “normal” when the precipitation falls within the 30-70 percentile range based upon the long term data. An example from a WETS table is provided in Appendix E. Please note the “Mom & Pop” data collection cautions discussed in the *Precipitation Data* section above.
4. **Growing Season**—Hydrologic observations are linked in The Manual to the growing season in order to help ensure that practitioners did not observe inundation in the winter and assume that wetland hydrology was present, particularly if plants were dormant and presumably not greatly affected by the inundation. There was also an assumption that microbial activity in the soil stopped when soil temperatures fell below biological zero. User Notes in The Manual define growing season as “the portion of the year when soil temperature measured at 20 inches below the ground surface (bgs) is above biological zero (41 degrees F).” It then states that one can approximate that period by the number of frost-free days, estimating starting and ending dates based upon 28 degrees F air temperatures (5 years in 10). The WETS tables (Appendix E) also provide growing season dates for each weather station, which is more accurate than using soil survey data. (See sources of information.)

Growing season periods, which were developed for and are pertinent for crops and ornamentals, have proven to be a problematic concept with respect to wetland delineation. What little research has been done has shown, for example, that soil temperatures at 20 inches bgs in the Willamette Valley rarely, if ever, drop below biological zero. Other research has shown that microbial activity does not necessarily cease at temperatures below biological zero. As a general rule of thumb, if you are conducting field work and vegetation is clearly growing and soils are not frozen, you are

within the growing season. That said, be cautious about direct observation of hydrology during winter rainy periods; consider both seasonal and recent rainfall. Also be sure to collect soil and vegetation data, even if inundated (most likely you'll need to collect the soil sample at the edge of the inundation), to help establish that wetland hydrology is indeed present.

5. Field Indicators—A number of field indicators are discussed in Section 49 of The Manual. As noted in the *Criteria vs. Indicators section*, most hydrology indicators presented in The Manual are for flood-driven systems that will have periodic flooding or inundation; almost none are provided for saturated wetland systems. Subsequent COE guidance separated field indicators into “primary” and “secondary” indicators. All but one of the primary indicators (observed saturation within 12 inches of the surface) are pertinent only to inundated wetlands. Hydrology indicators for saturated-only wetlands, such as slope wetlands, are pretty much limited to secondary indicators. Two secondary indicators are required to determine that a site has wetland hydrology. With nearly all indicators, it is important to use your BPJ to evaluate the likely duration of inundation or saturation (be sure to discuss your BPJ decisions in the WD Report). Soil and vegetation data provide useful information for evaluating duration, but cannot be used as a substitute for hydrology data. A few comments on specific indicators:

Oxidized rhizospheres—Considered a reliable indicator of saturation to the surface, but make sure they are associated with live roots (i.e., not relict features). Sometimes you can rub the red iron stain off the root. A hand lens is helpful to evaluate this indicator. Oxidized rhizospheres are fairly common in herbaceous wetlands, including cultivated fields. Be aware, however, that they sometimes develop in shallow surface layers as a result of compaction, for example in heavily trampled pastures. Also, absence of oxidized rhizospheres does not indicate absence of hydrology, as not all plants or soils create these features.

FAC-Neutral Test—To apply this indicator, recalculate your 50/20 rule for vegetation omitting all FAC species (FAC-, FAC and FAC+) in your plot. If there are more FACW & OBL species than FACU & UPL species, the indicator is met. If the test results in a “tie” or the only FAC species are subdominants, include all identified species in your calculation, not just the dominants. If you still get a tie, additional hydrologic indicators and/or data may be necessary.

Other—Other indicators of wetland hydrology can include any you observe that, based upon your experience and BPJ, indicate wetland hydrology. Some commonly-used indicators in our region include:

- *Depressions*: The lowest point in the local terrain; depression(s) in a generally flat landscape; patterned depressions similar to drainage patterns.
- *Hummocky topography*: Similar to depressions but related to plant morphology. A good example is *Deschampsia* prairie wetlands where water ponds between *Deschampsia* hummocks.

- *Raised ant mounds:* Ground-nesting silky ants that build earth domes above ground in poorly drained soils. Common in the Willamette Valley and likely in some other regions, as well.
- *Landowner information:* Land owners who have owned the land for a long time, particularly if they farm it, can be an excellent source of information. However, such information may have to be closely evaluated if the land owner has a vested interest in the outcome of the delineation.
- *Cracked soil:* Deep cracks in soil surface may reflect early season inundation.

D. Soils Guidance

The guidance below addresses the most common problems we find.

1. ***Soil Pits***—Dig a soil pit to at least 16 inches in depth unless it is not physically possible (e.g., encounter shallow bedrock). For pits described on your data sheet, use a shovel to dig the pit. This is important for describing the soil profile and observing hydrology indicators. Augers and probes may be used for spot checking (data not included on data sheets); break the core open to observe features, as the coring device can smear and spread soil colors. All pits should be refilled following sampling to prevent amphibian trapping and injury to larger animals and humans.
2. ***Soils Description on Data Sheets***—Describe each horizon from soil surface (beneath litter) to bottom of pit. It is not necessary to identify the horizon by name, but it is important to provide the depth range (e.g., 0-4"; 4-10"; 10-16"). One description from approximately 10" depth (as suggested in *The Manual*) does not provide sufficient information to assess the strength or weakness of features observed and morphological indicators of depth of saturation. Use standard NRCS terminology for describing soil colors, redoximorphic features, and soil texture. Either Munsell Soil Color Charts or *EarthColors – A Guide for Soil and Earthtone Colors* can be used for soil color descriptions (note in report which was used).
3. ***NRCS Field Indicators of Hydric Soils***— Please refer to *Other Technical and Guidance Documents Section* for a discussion of NRCS Field Indicators. A link to the Field Indicators is in the Additional Information section.
4. ***Reducing Conditions***—This indicator is often incorrectly checked on data forms. Reducing conditions means that chemical reduction is known to be occurring at the time of the site visit. Although not often used in delineation work, reduction in a mineral soil will generally be tested by applying alpha-alpha-dipyridyl solution to a small soil sample. If it reacts by turning pink, ferrous iron is present, which indicates a reducing soil environment. Another, less reliable technique is to remove a chunk of saturated soil and expose it to oxygen to see if it changes color (redder) upon re-oxidation (this may take several hours). Note that these tests may not work in some soils, such as soils with little or no iron.

5. Problem Soils—Soil colors and redoximorphic features cannot be relied upon in some mineral soils. Some soils have a low chroma due to organic matter or dark parent material, and not necessarily as a result of anaerobic conditions and reduction. Other soils will not show redox concentrations and similar features for a number of reasons, including: lack of iron; alkalinity; or low organic matter (thus little microbial activity). Problem soils in our region include sand, volcanic soils, alkaline soils in semi-arid regions, river bars and adjacent flats, Entisols (young or recently formed soils), Spodosols and some Vertisols. (See Appendix G) As you conduct field work, always consider the soil type you are dealing with before relying on soil colors alone. Enlist the help of a soil scientist with hydric soils expertise, if needed.

E. Vegetation Guidance

This section provides agency guidance, as well as hints on how to avoid common errors and handle common problems.

- 1. Which Plant List?**—The currently accepted U.S. Fish and Wildlife Service (FWS) wetland plant list for Oregon is the 1988 list as updated by the 1993 supplement. Both are available on the FWS National Wetlands Inventory web site (<http://wetlands.fws.gov/plants.htm>). The 1993 list is not comprehensive; it only contains species that had a change in indicator status. So check the 1993 list first and if the plant is not listed, check the 1988 list. (The COE Portland District created a combined 1988/93 list that you may obtain from the COE or DSL.) The FWS web site also includes an updated 1996 (AKA 1998) plant list; however, at the time of this guidance publication, it has not been officially “approved” by all the federal agencies nor is it recognized by the COE as being valid for use in making wetland delineations.
- 2. More Background on the Plant List**—The plant list dates back to the early 1970s and was originally intended for National Wetlands Inventory staff use. If you have never read the introductory sections in the 1988 list—or if it’s been a long time since you have—it contains useful background information on how the list originated, how it was compiled, and how it evolved over time, including the indicator status system and formation of regional review panels. The intent, of course, was that the list (and database) would be continuously refined and that sub-regional lists would be developed. The latter effort is important given that, for example, the Region 9 list for Oregon also covers Washington, Idaho and portions of Montana and Wyoming. Although the 1996 list has stalled, data supporting a change to a plant’s indicator status may still be submitted to the panel.
- 3. NI vs. NOL Indicator Status**—Often, we receive data sheets that list a species as NI (no indicator status) when the species cannot be found on the plant list. That is not correct. If a species is not found on the list, it is “assumed” to be an obligate upland plant (be sure to check the synonymy section) and the correct status to list is NOL (not on list) or U (upland). NI is reserved for those species for which insufficient information was available to determine an indicator status. Those species are indicated by “NI” on the list and should be included on the data sheet as NI. They are “neutral,” not Upland, and they are not used in the calculation to determine whether or not the plot has hydrophytic vegetation. If a species is listed as NI on the Region 9 list but has an indicator status

listed in an adjacent region, you may use that status if your site is located near the other region (for example, Southern Oregon).

- 4. *Vegetation Sampling***—There are many references available on vegetation sampling methods and their respective strengths and weaknesses. The most commonly used sampling method, by far, for wetland determination is visually estimating the percent cover of plant species within a sample area—usually a visually-estimated plot, but sometimes using a measuring tape or sample frame. Plot placement considerations were discussed on page 6 of this guidance. You may either estimate absolute % cover of a plot for each species or relative % cover (so that the total equals 100%). The former tends to be more accurate; if you record absolute cover, you will later need to convert the data to relative cover to use the 50/20 rule (described below and in Appendix H). It is essential that you indicate on the data sheet which approach you used, and if you use relative cover you must also provide the actual, total plot cover. Here’s why—if you estimated and recorded relative % cover of a shrub stratum with two species present equaling 100%, they may actually cover only 5% of the plot area. Unless the agency reviewer knows that, there would be no way of knowing, without a site visit, that the shrub component is nearly meaningless compared to the herbaceous stratum that may actually constitute 120% plot cover. See the DSL wetland determination forms in Appendix G for two different examples—one recording absolute % cover and one showing both absolute and relative % cover.

Below are some hints for those who may be relatively new at estimating cover, especially during sub-optimal times of the year:

- Be aware of a natural bias toward plants you know; plants you like; taller plants that you don’t have to get down on your knees to search for.
- Do get down on your knees and run your hands through the plot to locate those low growing, fine-leaved, hard-to-identify but often dominant species.
- Flowering plants may appear more dominant at first glance because they catch your eye.
- Broad leaved plants tend to have great % cover, but sometimes the fine-leaved ones, though less apparent, have just as much cover.
- Consider only plants that are rooted in the plot. Some trailing plants, like blackberry, may be in the plot but are actually rooted at a different elevation. The same may be true for overhanging trees.
- If it’s winter, estimate tree and shrub cover as though they were fully leaved.
- Use BPJ as needed if plant morphology may skew your results—a single rooted blackberry stem may result in many canes dominating a plot (and also shade out other plants).
- Consider what plants are rooted on—in many forested areas, for example, shrubs and other plants grow from downed logs or from the elevated base of trees and are not rooted in the substrate at all. If so, they clearly are not useful indicators.
- If you are working in more than one team, calibrate your sampling methods before separating.
- Consider the season and any vegetation manipulation (see discussions below).

- Be aware of plant communities that have a dominance of early season hydrophytic plants and a late season dominance of non-hydrophytic ones.
- Know that Obligate and Facultative Wetland Plants sometimes grow in uplands and that Upland and Facultative Upland plants sometimes grow in wetlands.
- Plants not identified to species (e.g., *Festuca* sp., *Carex* sp., unidentified grasses) cannot be assigned an indicator status in a delineation report.
- Sometimes, aggressive plant species (e.g., *Rubus discolor*) preclude other species, obscure areas (e.g., drainages or depressions) with a more hydrophytic plant community, or when removed are replaced by a more hydrophytic plant community.

5. *Plant Identification*—It is essential, of course, to be able to identify most common species in the region in which you work, and important to be able to key out plants and know where to obtain help, when needed. Luckily, for wetland delineation it is not imperative that one identify every tiny, newly-sprouting forb in a plot. On the other hand, it is crucial to have dominant species correctly identified. The most common traps to proper identification include:

- Using photographs in books to identify plants—with very few exceptions, this is not reliable.
- Jumping to conclusions—it looks like something you’ve identified before but you didn’t check it carefully, or you are in a different region than your normal work area and though it looks like familiar old plant Z, it’s actually close relative Y.
- It’s the wrong season to identify it with certainty so you take a wild stab at it.

Get more training if you need to. Know when to get help. Collaborate with another investigator, take a complete (roots and all) plant specimen to a colleague or herbarium, or find a friendly plant enthusiast at a local university—some people actually *enjoy* keying out *Carex*!

6. *50/20 Rule*—The 50/20 method of determining dominant species is recommended by the COE and required by DSL. Unfortunately, it seems to cause much confusion. The 1989 *Federal Manual for Identifying and Delineation Jurisdictional Wetlands* provides some explanation, but the best guidance is in the COE training materials. Rather than describe it here, the examples in Appendix H provide the best explanation. If you still have problems, you are welcome to make an appointment with one of the authors of this guidance to go over the method with you.

7. *Minor Stratum*—The 50/20 method requires determining the dominant plant species for each stratum, then giving those dominants equal weight when using the basic rule to determine if the hydrophytic vegetation criterion is met. If one of the strata is very sparse compared to the others, giving it equal weight may not be appropriate. For example, the herbaceous stratum may have 100% or greater cover but the shrub stratum may consist of a single small shrub (thus, it is the dominant species for that stratum). Based upon BPJ, you may decide to omit that shrub stratum from your final calculation, but the shrub should be listed and your decision explained on the data sheet.

8. **Seasonality**—Vegetation composition may change significantly during a single year due to Oregon’s summer-dry climate and the seasonal hydrology typical of most western wetlands. Much longer periods of variation can also occur due to drought or unusually wet climatic regimes. The annual variation is considerably easier to evaluate. When conducting field work, always consider the season and the potential variation in the plant communities on the site, especially with herbaceous species. For example, seasonal pools in prairie wetlands are generally dominated by FACW and OBL species during the spring and early summer, but the most evident species in late summer and fall may include a substantial component of FACU and UPL species. Usually, however, the senescent stems and flowers of the earlier-blooming species can still be found and the earlier plant community must be considered when evaluating whether the criterion is met. The species that were thriving in the spring are a better reflection of the wetland condition. Another example is the timing of grass blooming—when *Alopecurus pratensis* is in bloom in March and April it may appear to constitute 80% of the cover, but the same area may later appear to be 80% *Festuca arundinacea*. Both species are there, perhaps in equal proportion, but we tend to see what is blooming and what we can most easily identify.

Longer climatic variation is more difficult to evaluate. If the vegetation, soil and hydrology data don’t seem to “align” as they normally would, and there is no indication of disturbance, consider whether or not we are in a period of drought or above-average rainfall. Aerial photos representing a 20-30 year span and landowner information can be helpful. Also, check the records for the nearest weather station. Our task is to determine if the site meets wetland conditions more often than not over the long term—more than 50 years out of 100—while teasing out sites that have been effectively and permanently dewatered.

See also the discussion of seasonal wetlands in the Problem Wetlands section of The Manual and this guidance document.

9. **Grazed, Mowed, Herbicides and Other Disturbances**—A common joke among wetland delineators is the need for a course on identifying grasses in heavily grazed pastures in winter. Though such classes don’t exist, those site conditions certainly do! Heavy grazing and frequent mowing can make plant identification chancy. Often, you can request that mowing cease for a period of time or that livestock be removed from an area for a few weeks. Sometimes, you can time a field visit to occur before mowing commences. If you can’t identify several species, you may need to note “unidentified grasses” 60% cover on the data sheet. If a couple of the individual grasses in your plot have recognizable blooms, identify what you can but don’t attempt to estimate % cover unless you are absolutely certain from vegetative characteristics that all the grass is the same species. In this case, your data sheet may list “unidentified grasses” on one line and “*Dactylis glomerata*” on the next line and your comment section will state that you could not estimate % cover due to identification challenges. We will understand! In these cases, you will need to use your BPJ and lean more heavily on soil and hydrology indicators. On occasion, either the DSL or the COE (or both agencies) may require you to reevaluate a site when the plants would most likely be there and identifiable.

Other types of disturbances like regular herbicide application, seeding, selective grazing etc. alter species composition. See the Atypical Situations section of The Manual and page 20 Section V of this guidance for additional information.

- 10. Indicators of Hydrophytic Vegetation**—According to the Technical Guidelines (Part II) in The Manual, an area has wetland vegetation when “the prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions described in (the wetland definition).” Hydrophytic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.

Part III (Indicators) provides additional discussion of hydrophytic vegetation. Section 35 presents several indicators that may be used to determine if a site has a predominance of hydrophytic vegetation. The list is in order of decreasing reliability, and The Manual notes that any one of the indicators may be used. However, the first indicator (more than 50% of the dominant species are OBL, FACW or FAC) is often referred to as the “basic rule;” it has proven to be quite reliable in many—but not all—circumstances. Because it is the most frequently used and is the only one specifically noted on the Corps of Engineers data sheet, it is sometimes erroneously believed to be the only allowable indicator.

The other indicators of hydrophytic vegetation in Section 35 may be used when appropriate, but should be used judiciously. For example, the other indicator most often used by practitioners is indicator b(1), visual observation of the plant species growing in areas of prolonged inundation and/or soil saturation. This indicator should be used only when the practitioner has considerable experience with the species in the region and has frequently documented it growing in wetlands, and when there are strong indicators of hydric soil and hydrology. The experience and documentation of other practitioners may be considered as well, including data from other wetland delineation reports. (See Example in Appendix H) This indicator is often relied upon for FACU-dominated wetland plant communities, like Hemlock swamps.

Taxonomic references (indicator b(3)(a)) are another important source of information. As The Manual notes, several indicators may be used and the strongest case for the presence of hydrophytic vegetation can be made when several indicators are present.

The Manual also allows for use of the FAC-Neutral test (Section 35a. of The Manual) for hydrophytic vegetation when a question of indicator status of a FAC species arises. The procedures within Section 35a. of The Manual may be used for certain problem FAC species, such as *Festuca arundinacea*. Consult with the appropriate agency personnel for other situations.

- 11. Examples of Problem Species**—Because the most used sampling methods *normally* consider only dominant species, most of the species that present problems are those that tend to be dominants. While many are weedy species or escaped cultivated species,

many native species can also present challenges. Some species are considered hydrophytes based upon their indicator status, but are not reliable wetland indicators. These rarely present serious problems in delineation because the soil and hydrology criteria must also be met. However, they can cause problems, for example in atypical situations. Unless all species present are obligates (and more than one obligate species is present), always carefully evaluate soils and hydrology. Likewise, as discussed above, some species are considered upland plants based upon their indicator status, but are not reliable upland indicators.

✧ **Some Common “False Positive” Species:**

- *Alopecurus pratensis* (FACW)—introduced, widespread pasture species that is typically the first grass to bloom in the Spring; it may respond as much to spring wetness as it does to wetland conditions.
- *Phalaris arundinacea* (FACW)—Once established, it is persistent, has an extensive root system, and grows up onto levees and other non-wetland areas. It may appear shorter and less robust in drier areas than in wetlands.
- *Phalaris aquatica* (FACW); AKA *P. tuberosa* (FACU)—Planted for erosion control and rapidly increasing in the state. Some confusion over its actual identity. Experience to date indicates it prefers drier environmental conditions consistent with a FACU indicator status.
- *Ranunculus repens* (FACW)—Common in damp lawns throughout Western Oregon. Check soils and hydrology carefully.
- *Holcus lanatus* (FAC)—One of many non-diagnostic pasture species; *Holcus* often occurs in equal proportion on the upland and wetland sides of a wetland boundary.
- FAC species generally—because they are equally likely to occur in wetlands or non-wetlands, if FAC species dominate a plant community, careful consideration of soils, hydrology, and any subdominants is necessary.
- Many species in the coastal region, including *Carex obnupta* (OBL)—due to high precipitation and low evapotranspiration, many species that are reliable wetland indicators elsewhere are not reliable in the coastal region.

✧ **Examples of “False Negative” Species (FACU & FAC-) Known to Occur in Wetlands:**

- *Anthoxanthum odoratum*—introduced pasture species that is common in wet pastures or wet prairies, where it is often found with *Deschampsia cespitosa*.
- *Danthonia californica*—a native grass that is common, though rarely a dominant, in seasonal wet prairies.
- *Pinus ponderosa* (Willamette Valley ecotype)—though the former distribution is much reduced in the valley, small stands can still be found growing and reproducing in wetlands as well as uplands.
- *Festuca arundinacea*—a widespread, cultivated grass (with many commercial varieties) that grows in uplands or wetlands. In wetlands, it is commonly a co-dominant with *Deschampsia cespitosa* or *Alopecurus pratensis*.
- *Gaultheria shallon*—This species grows in coastal forested wetlands, perhaps only in organic soils; it may also be found living in ponded water areas rooted on top of vegetative mounds or old logs and stumps.
- *Rubus discolor*—This widely adapted, introduced blackberry occurs in seasonal wetlands and, because of its morphology, can easily be a dominant even if only one rooted stem is in a

plot. It's very aggressive and can completely cover an area with its canopy, thus reducing sunlight necessary for other species to grow.

✧ **Plant List Errors**

- *Leontodon nudicaulis* & *L. taraxacoides*—Both species are listed in the 1988 Region 9 synonymy list with an accepted scientific name of *Leontodon leysseri*. However, *L. leysseri* was omitted from the 1988 Region 9 listing, although it was included in the 1988 National Summary with a UPL indicator status for Region 9. Please add *L. leysseri* to your 1988 Region 9 list with the UPL indicator status.
- *Luzula campestris*—The 1988 Region 9 synonymy list has *Luzula campestris* listed twice with synonymies of *L. comosa* and *L. multiflora*. The synonymy should indicate that *L. campestris* var. *multiflora* is a synonymy of *L. multiflora* and that *L. multiflora* spp. *comosa* is a synonymy of *L. comosa*.

V. Atypical Sites

The Manual (Section F) provides guidance and procedures for how to handle atypical sites. Examples of atypical situations noted include enforcement cases, artificial wetlands and changes due to natural events where the wetland determination is more difficult due to changes like the intentional removal of vegetation or flood-borne deposition of sediment. The atypical site procedures should be applied whenever human activities or natural events have significantly altered vegetation, soils and/or hydrology. The most difficult aspect of making a wetland determination on atypical sites can be determining if the alteration is “recent” and whether or not it is the new “normal circumstances.” In some situations, the altered, current conditions are now stable, and thus the new “normal circumstances.” There is no hard and fast “rule” on assessing “normal circumstances.” (See the “USER NOTES” on page 4 of the online edition.)

Professional judgment based upon experience and, sometimes, discussion with agency personnel is needed.

If a recent alteration was due to filling, grading, ditching or land clearing, the agencies will need to know the approximate date and scope of the alteration (in order to determine if a permit was required). For enforcement purposes, the condition of the area prior to the alteration is often more relevant than whether or not the site represents normal circumstances at the time of the investigation or discovery of the unauthorized action.

A. *Examples of Common Atypical Situations*

1. **Mowed sites**—Sites where the vegetation has been recently and/or is regularly mowed, making plant identification extremely difficult. In addition, many mowed sites are also managed lawns. Consideration must be given to the effect of seeding and herbicide use.
2. **Recent deposition of sediment**—This may be from natural processes or offsite land disturbance. Recent sediment may bury the previous soil surface and because soil characteristics are imported from offsite, they will not reflect in situ conditions.

3. ***Land clearing activities***—Removal of vegetation by tree cutting, brushing, grubbing, stump removal etc. Sometimes pre-disturbance vegetation can be determined from remnants or brush piles or landowner knowledge. Sometimes adjacent reference sites must be relied upon.
4. ***Fire***—Major fires, not uncommon in the west, alter vegetation but may also alter soils. The fire itself, fire suppression activities and natural or intentional restoration can all contribute to creating atypical conditions.
5. ***Recent hydrological manipulation***—This situation may include recent ditch construction, installation of French drains, ditch cleaning, diversion structures, new impoundments (intentional or otherwise), clogged culverts and so on. If the alteration is quite recent, soils and, to a lesser extent, vegetation reflect the previous condition. Depending on the circumstances, it may be necessary to determine pre-alteration conditions. The primary example would be if agency staff need to determine if a violation occurred. In other cases it may be necessary to determine if the hydrologic alteration created an entirely new wetland area (from former upland) or if it completely removed wetland hydrology. The latter can be extremely difficult to determine due to the persistence of hydric soil indicators, the lag time for many plant species to disappear (if at all), and the expected seasonal and annual variation in hydrology. If in doubt about what to investigate, contact the agency representatives.
6. ***Managed hayfields***—These include regularly mowed sites that are occasionally plowed and re-seeded. Such management information is important to consider, as the species present are not representative of the native plant community and may not adequately reflect hydrologic conditions. Subdominant species and weeds often provide useful information.
7. ***Heavily grazed pastures***—Alterations include chronic disturbance and compaction of soils by livestock; selective grazing of desirable forage species; seeding; and introduction of weedy species through natural seeding of weeds on disturbed surfaces and through feed and manure. For hayfields and pastures, information about the seed mix used is sometimes available from the landowner or lessee (Example in Appendix I).
8. ***Intensively managed for agricultural production***—These sites, used to grow crops of all kinds, are especially difficult because all three “parameters” are disturbed. Soils are regularly plowed; hydrology is altered by surface or perimeter ditches, subsurface drainage, leveling, directional plowing and/or soil alteration; and natural vegetation is replaced by cultivated species. Considerable experience is required to make accurate wetland determinations on such sites. See additional guidance in Appendix D.

VI. Problem Wetlands

Problem areas are discussed in Section G of The Manual. They are wetland types where normal environmental conditions make wetland determination difficult. The Manual provides a few examples of problem areas, but states that similar situations may sometimes occur in other wetland types. Some examples of problem wetlands found in our region include the following:

1. ***Seasonal Wetlands***—Seasonal wetlands are described in The Manual. Seasonal wetlands are the norm in the Western U.S., especially in the arid and semi-arid regions. Due to our summer-dry Mediterranean climate, wetland hydrology indicators can be difficult to find during the summer and fall. As discussed in the Hydrology section of this guidance, most of the hydrology indicators in The Manual were developed based upon information from the Southeastern U.S. and are indicators of flooding and ponding. Almost no indicators of seasonal saturation are provided. Many seasonal wetlands are also characterized by shifting plant communities—wetter species in the early spring replaced by drier species in the summer and fall. It is important to look for and note senescent species that were dominants earlier in the year, and to become familiar with wetland types that may be dominated by upland species during the summer and fall. See more discussion under the Vegetation section of this guidance. (Note: the COE is developing regional supplements to The Manual. The western supplements will better address these problems).
2. ***Vernal Pools***—These are highly seasonal wetland types of arid regions that are characterized by a shallow impermeable layer in the soil, ephemeral wetland hydrology and specifically adapted plant (and animal) species. Very often, they support rare species, as do many of the Agate Desert vernal pools in Jackson County.
3. ***Interdunal Wetlands***—Wetlands are common in interdunal swales along the coast. They are highly seasonal, groundwater driven systems that can be difficult to delineate due to the sand substrate (that often lacks hydric soil field indicators) and rapid changes in hydrology as the groundwater drops in the spring. They are also highly responsive to annual and decadal variation in precipitation. In addition, blowing sand from dynamic dune systems may add sand to some areas and scour it from others, causing the wetland boundaries to change gradually (or not so gradually) over time. Boundary delineation in such circumstances is difficult due to the lag time in vegetative response.
4. The following additional problem wetlands in our region are described in Appendix G:
 - ***Playas***
 - ***Evergreen Forested Wetlands***
 - ***Vegetated River Bars & Adjacent Flats***
 - ***Vegetated Flats***
 - ***Newly Created Wetlands***
 - ***Dynamic Sites***
 - ***Shallow Soil Wetlands***

VII. Role of Best Professional Judgment

The Manual is a tool for determining whether or not an area meets the definition of wetland in state and federal law. While The Manual has provided for reliable results among users for most sites, it recognizes (even stresses) that “training, experience, and good judgment” is required and that site-specific conditions often require modification of field procedures. Much has been learned since The Manual was first developed, and over the years technical guidance has been issued and certain conventions have evolved. Many of these conventions were incorporated into DSL’s delineation report rules. For example, the “routine determination” method for sites less than 5 acres in size is never suitable for permit purposes because it is too coarse and as a result it would be very difficult to replicate or verify results.

BPJ is required for each and every wetland determination; some of these judgments become so automatic that experienced practitioners barely think about it. Some sites or situations are far more challenging, and experienced professionals may at times disagree. Nearly all sites are disturbed to some degree. Listed below are a few examples of common questions where the application of BPJ would be necessary:

- What effect has land use had on the site?
- Is this an “atypical” site?
- Are “normal circumstances” present? Are the altered conditions “permanent?”
- What area(s) are “obvious upland” that require no data and where should plots be concentrated?
- What is an appropriate plot size and configuration?
- What effect has seasonality had on observed dominant plant species?
- Is this plant acting as an ecological hydrophyte even though it does not have an indicator status of FAC or wetter?
- Has this soil been imported? Buried? Scraped?
- Is lack of redoximorphic features due to lack of hydrology or soil chemistry?
- If it’s not “predominantly vegetated” is it wetland or some other water of the state/US? Why isn’t it vegetated?
- Am I within the growing season? How do I know I’m within the growing season?
- How do I correlate seasonal and recent rainfall to my hydrology observations? Is the rainfall (or lack of rainfall) normal for my sampling date?
- I’m here for one day on January 12th (or August 12th); does the site meet hydrology criteria for the appropriate duration during the growing season?

Part I of The Manual also suggests a number of situations that require application of BPJ. Ultimately, it’s agency personnel who must determine whether or not the wetland definition in state and federal regulations is met.

VIII. Hints for Faster Agency Review

A WD Report that meets all requirements outlined in The Manual (for the COE) and in the DSL rules and that contains clear, easily interpreted maps and information speeds review and eliminates agency requests for additional information. The goal of agency staff is to spend as

little review time as necessary to ensure compliance with requirements and accurate results. If agency approval of a firm's reports routinely requires more than two requests for additional information, if the agency frequently field verifies the firm's delineations, or if agency staff frequently make more than one visit to the same site to field verify a delineation, that's an indication of problems that need to be addressed. In such situations, the firm or the agency may request a meeting to discuss the problem and how to make improvements.

Suggestions for faster WD Report review include:

- Be succinct! Put boiler plate background information on The Manual designed for your client in an Appendix.
- Include the required, signed report cover sheet even if submitted with a permit application (Appendix A).
- Avoid duplicative report sections, like a long executive summary followed by the report body followed by a summary.
- Avoid detailed descriptions in the report body of the soils, vegetation and hydrology of each plot or area; it is hard to follow and relate to the delineation map and tends to be duplicative of information on the data forms. Instead, include all explanations in the comments section on the pertinent data forms (see example in Appendix J).
- Don't reproduce verbatim the soil series or map unit descriptions from the soil survey. We have soil survey information on hand. We only need to know what soil series units are mapped on site and if the unit(s) is on the county hydric soils list, and what soil features you actually found on the site.
- You are our eyes. Describe the site well, including any previous fill, excavation, buildings, land uses etc. on the parcel or adjacent alterations that affect the parcel under investigation. Ground color photos and aerial photos are extremely helpful. This information often eliminates the need for an agency onsite verification.
- Make sure all maps are legible, including data plot numbers. If the wetland delineation map is a professional land survey map, make sure it is legible (size it appropriately) and includes all required map elements. It does not need to be 8 ½ by 11, although an 8 ½ by 11 version may be required with a permit application for inclusion in a public notice.
- Make sure your data forms include all required information (on COE form and in DSL rules), reflect only one field date, and are legible. If it is two-sided, include the plot number on the back side (prevents copying mismatches).
- Know the DSL WD Report rules thoroughly and use the checklist (Appendix A) as a reminder.
- Quality control is essential! Many agency requests and delays could be prevented by better quality control, especially where a number of personnel from the firm are combining resources in the completion of the report.

IX. Training and Certification

Courses and training in wetland delineation and related subjects (soil morphology, hydric soils, soil hydrology, plant identification—summer, winter, grasses, etc.) are available from a variety of private and public entities. Neither the state nor the federal government have a training program nor a certification requirement for non-governmental persons preparing and submitting

WD Reports. However, there is an expectation that persons submitting reports to the agencies have the necessary skills and training, including a five-day course in wetland delineation.

Note that completion of a wetland delineation course is not the same as “delineator certification” and should not be represented as such. The COE conducted a pilot certification program several years ago and a few individuals were “provisionally certified,” but the program was never funded and implemented. If you were “provisionally certified” it is fine to include that fact in your resume. Completion of a delineation course should be listed as training received.

The Society of Wetland Scientists’ Professional Certification Program is the only wetland-specific professional certification program. Applicants who meet specific educational and experience requirements may be certified as either a Wetland Professional in Training (WPIT) or a Professional Wetland Scientist (PWS). This is a broad-based professional certification, not a delineator certification, but is a useful and recommended certification for those in the profession. Increasingly, private and public clients require professional certification for contracted services.

Appendices

- A. DSL's Jurisdictional Determination and WD Report rules, Checklist and Report Cover Form
- B. Examples of Site Location and a Study Area Within a Tax Lot
- C. Effective Use of Site Photographs
- D. Hints for Conducting Wetland Delineations on Cropped Land
- E. WETS Tables
- F. Data Plot Location Examples
- G. Problem Wetlands and Problem Soils
- H. Vegetation: Determining Dominant Species, the 50/20 Rule, Data Forms
- I. Example of Seed Mix Information
- J. Example of Informative Data Forms
- K. Crib Sheet for Describing Redoximorphic Features
- L. Example of Wetland/Upland Mosaic Delineation

Links to Additional Information Sources

Department of State Lands Website (regulations, WD Report rules, NWI & LWI maps, staff contacts): <http://www.oregonstatelands.us>

Corps of Engineers, Portland District Website (regulations, staff contacts):
<http://www.nwp.usace.army.mil/>

U.S. Environmental Protection Agency HQ, Office of Wetlands, Oceans and Watersheds:
<http://www.epa.gov/OWOW/OWOW/>

Corps of Engineers Wetlands Delineation Manual:
<http://www.saj.usace.army.mil/permit/documents/87manual.pdf>

List of Plants that Occur in Wetlands: <http://wetlands.fws.gov/plants.htm>

NRCS Plants Database: <http://plants.usda.gov/>

Hydric Soils: <http://soils.usda.gov/use/hydric/>

NRCS Hydric soils indicators:
ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/FieldIndicators_v5_01.pdf

Soil Survey Reports:
http://www.or.nrcs.usda.gov/pnw_soil/mol_reports.html

WETS tables and other NRCS weather data:
<ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/or/>

Oregon Climate Service: <http://www.ocs.oregonstate.edu/index.html>

National Weather Service, Portland:
<http://newweb.wrh.noaa.gov/climate/index.php?wfo=pqr>

NRCS National Water and Climate Center:
<http://www.wcc.nrcs.usda.gov/climate/climate-map.html>

Oregon Tax Maps: <http://www.ormap.org/index.cfm?opt=mapsonline>

U.S. Fish and Wildlife Service, National Wetlands Inventory:
<http://www.nwi.fws.gov/>

Society of Wetland Scientists: <http://www.sws.org/>

Association of State Wetland Managers: <http://aswm.org>

Report Guidance Authors

Janet Morlan, Wetlands Program Manager, Oregon Department of State Lands
Jim Goudzwaard, Wetlands Specialist, U.S. Army Corps of Engineers, Portland District
Yvonne Vallette, Oregon Wetlands and Watershed Coordinator, Environmental Protection
Agency, Region 10

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Appendix A: Department of State Lands' Rules for Wetland Delineation Reports

- **Administrative Rules 141-090-0005 through 0055**
- **Checklist for Above Rules**
- **Wetland Delineation Report Cover Form**

All of the above are also available on the DSL web site.

DEPARTMENT OF STATE LANDS

DIVISION 90
ADMINISTRATIVE RULES FOR WETLAND DELINEATION REPORT
REQUIREMENTS AND FOR JURISDICTIONAL DETERMINATIONS FOR THE
PURPOSE OF REGULATING FILL AND REMOVAL WITHIN WATERS OF THE
STATE

141-090-0005

Purpose

The purpose of these rules is to establish standards and procedures by which the Department of State Lands makes jurisdictional determinations of wetlands and other waters of the state. These rules also establish minimum standards for wetland determination and delineation reports submitted to the Department for review and the procedures for Department review and approval.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0010

Applicability

(1) These rules establish the standards and procedures used by the Department of State Lands to identify waters of this state that are subject to regulation and authorization requirements of the Removal-Fill Law (ORS 196.800 to 196.990).

(2) These rules are supplemental to administrative rules for issuance and enforcement of removal and fill authorizations (OAR 141-085; OAR 141-0102); rules pertaining to wetland conservation plans and local wetlands inventories (OAR 141-086; OAR 141-120); rules pertaining to the identification of significant wetlands (OAR 141-086); rules pertaining to General Authorizations (OAR 141-098); and rules pertaining to Oregon Scenic Waterways (OAR 141-100).

(3) Agencies such as the U.S. Army Corps of Engineers (Corps of Engineers) and the Natural Resources Conservation Service have separate regulatory authority over waters of the United States and separate jurisdictional determination procedures.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0015

Policy

(1) It is the policy of the State of Oregon that the protection, conservation and best use of the water resources of this state are matters of the utmost public concern (ORS 196.805) and that the state use a single definition of wetlands and a single, uniform methodology of delineating wetland boundaries (ORS 196.672).

(2) In accord with these policies the Department shall, to the greatest extent possible:

(a) Provide a clear process for making, modifying or reissuing jurisdictional determinations, including wetland boundary delineations;

(b) Make jurisdictional determinations using the best available science, technical guidance and documents, including the 1987 U.S. Army *Corps of Engineers Wetland Delineation Manual*;

(c) Use sound professional judgment in interpreting maps, aerial photographs, environmental data and other relevant documents;

(d) Provide jurisdictional determinations that improve the level of regulatory certainty for landowners and developers and that help ensure that fill or removal of material in waters of the state does not occur without a required removal or fill permit; and

(e) Encourage landowners and developers to utilize wetland delineation reports at the earliest stage of site development planning in order to incorporate measures to avoid and minimize impacts to wetlands and other waters and thus prevent unnecessary regulatory delays.

(3) Because wetlands and other waters of the state can be affected over time by both natural changes and human activities, jurisdictional determinations are not valid for an indefinite period of time.

(4) The Director of the Department of State Lands shall designate employees responsible for making jurisdictional determinations as described in these rules.

(5) The Department shall give priority to the review of wetland delineation reports submitted with or in advance (i.e., within 90 (ninety) days) of an authorization application.

(6) Final authority for determining the adequacy of the procedures, methods, application of technical documents, interpretation and analysis of maps and data, and conclusions regarding the identification of waters of the state and jurisdictional determinations rests with the Department (ORS 196.815(1); ORS 196.845).

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0020

Definitions

For the purpose of these rules:

(1) "Agent" means a business partner, attorney or any individual who is legally authorized to represent the landowner's interests.

(2) "Applicant" means a person who has applied to the Department for a jurisdictional determination and/or a removal or fill authorization.

(3) "Atypical Situation" means a site or situation where the usual methods of making a jurisdictional determination cannot be employed due to human-caused activities or alterations of the "normal circumstances," or natural events, such as a flood, that have recently altered a site.

(4) "Authorization Application" means the written application for an authorization to place fill in or remove material from waters of the state as required by OAR 141-085, OAR 141-089, OAR 141-0100 and OAR 141-0102.

(5) "Basis of Jurisdictional Determination" means a summary statement of the criteria and indicators that support the Department's jurisdictional determination.

(6) "Change in Circumstances" means a change in site conditions that fundamentally alters the hydrology and/or substrate to the extent that the "normal circumstances" of

waters of the state are changed. The change in circumstances may be due to alterations on a site or alterations offsite that affect the site sufficiently to enlarge, reduce, or change the status or geographic extent of a jurisdictional water. A change in circumstances includes, but is not limited to, a dike breach or drainage system failure that restores former hydrologic conditions to a site, placement of fill material, or a water source diversion.

(7) "Consultant" means a private individual or firm whose business is to provide professional services to the public.

(8) "Delineation" means a determination of wetland presence that includes marking the wetland boundaries on the ground and/or on a detailed map prepared by professional land survey or similar accurate methods.

(9) "Determination" means a decision that a site may, does, is unlikely to, or does not contain waters of the state, including wetlands. A determination need not include the precise location or boundaries of any wetlands or waterways determined to be present.

(10) "Director" means the Director of the Department of State Lands or his or her designate.

(11) "Department " means the Oregon Department of State Lands, including the Director.

(12) "Final Order" means a final agency action expressed in writing. "Final order" does not include any tentative or preliminary agency statement, including a "preliminary jurisdictional determination," and does not preclude further agency consideration of the subject matter of the final order.

(13) "Global Positioning System" (GPS) means a navigation system which consists of a network of satellites and earth receiver stations which allows a person to determine, via a receiver, their respective position in latitude, longitude, and altitude.

(14) "Indicator" means soil characteristics, vegetation, hydrology evidence or other field data that indicate, by their presence or absence, the existence of certain environmental conditions. Indicators are used with other information, mapped or anecdotal, to determine the state's jurisdiction over waters of the state.

(15) "Jurisdictional Determination" (JD) means a written decision by the Department that waters of the state subject to regulation and authorization requirements of OAR 141-085, OAR 141-089, OAR 141-0100 and OAR 141-0102 are present or not present on a land parcel. The JD may include a determination of the geographic boundaries of the water area subject to state jurisdiction. For example, a JD may include the location of a wetland boundary or the location of the ordinary high water line of a waterway. A JD may, but does not necessarily, include a determination that a particular activity in a water of this state is subject to authorization requirements. The decision record includes the basis of the jurisdictional determination and is a final order subject to reconsideration according to the provisions in 141-090-0050.

(16) "Landowner" means the legal owner of the parcel(s) for which a JD is requested or made.

(17) "Local Wetlands Inventory" (LWI) means a wetland inventory map and supporting data that is conducted according to the requirements in OAR 141-086 and has been approved by the Department.

(18) "Manual" means the 1987 U.S. Army *Corps of Engineers Wetlands Delineation Manual*.

(19) "National Wetlands Inventory" (NWI) means the wetlands inventory prepared by the U.S. Fish and Wildlife Service.

(20) "New Information" means data, reports, photographs, observations or similar information that is provided to or obtained by the Department after the Department has issued a jurisdictional determination or issued an authorization.

(21) "Non-wetland" means an area that does not meet the wetland definition and criteria.

(22) "Normal Circumstances" means the hydrology, soil and vegetative conditions that are naturally present, regardless of whether or not the soil or hydrology has been recently altered or the natural vegetation has been removed or altered. "Normal circumstances" includes a consideration of the permanence of any change to the site; for example, if several feet of fill material are placed on a wetland the new "normal circumstances" may be non-wetland. In such a situation, the Department may determine if the placement of fill material required a fill permit.

(23) "Offsite Determination" means a determination by the Department or any other person that is conducted without a site visit using maps, aerial photographs, observations from adjacent areas, and/or interviews with persons familiar with the site. An offsite determination is considered to be a Preliminary Jurisdictional Determination unless otherwise stated in writing by the Department.

(24) "Onsite Determination" means a determination by the Department or any other person that includes a site visit to collect relevant data. An onsite determination may be either a Preliminary Jurisdictional Determination or a JD.

(25) "Other Waters" means waters of the state other than wetlands.

(26) "Person" means an individual, corporation, firm, partnership, estate, association, body of government or other legal entity.

(27) "Preliminary Jurisdictional Determination" (PJD) means an advisory determination issued orally or in writing stating that wetlands or other waters of the state are present or not present on a parcel of land. Because a PJD is advisory in nature it has no specified duration or expiration and is not subject to appeal. PJDs include all wetland determinations by any person other than the Department, and also include wetlands mapped on the NWI or on a LWI.

(28) "Primary Contact" means the person or firm designated by the landowner, agent or applicant to serve as the Department's contact for the purpose of the review and approval of a wetland determination or delineation report.

(29) "Removal-Fill Law" means ORS 196.800 through 196.990 and rules adopted thereunder relating to the filling and/or the removal of material in waters of the state.

(30) "Report" means a wetland determination or delineation report.

(31) "Sample Plot" means an area on a parcel of land within which environmental data (e.g., soils, hydrology and vegetation) are collected that is representative of that area.

(32) "Waters of the state" means natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and nonnavigable, including that portion of the Pacific Ocean which is in the boundaries of this state (ORS 196.800(14) and OAR 141-085-0010 and 0015).

(33) "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal

circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (ORS 196.800(16) and OAR 141-085-0010).

(34) "Wetland Boundary" means a line marked on the ground and/or on a map that identifies the boundary line between wetlands and non-wetlands.

(35) "Wetland Delineation Report" means a written document that contains the methods, data, conclusions and maps used to determine if wetlands and/or other waters of the state are present on a land parcel and, if so, describes and maps their location and geographic extent.

(36) "Wetland Determination Report" means a written document that contains the methods, data, conclusions and maps used to determine if wetlands and/or other waters of the state are present on a land parcel and, if so, describes their approximate location and size.

(37) "Wetland Map" means a map included in a Wetland Determination or Delineation Report or provided by the Department that shows the parcel(s) and/or areas investigated and the location, size and boundaries of any wetlands and other waters.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0025

Procedures for Determinations Conducted Entirely by the Department

(1) The Department shall make a determination (PJD or JD) according to the procedures in this section.

(2) The Department may make a determination for a number of reasons, including but not limited to:

(a) A written request from any person (e.g., a landowner or their agent) requesting a determination for a particular parcel or parcels;

(b) A Wetland Land Use Notice from a local government as required by ORS 196.676;

(c) A site development notice from a local government;

(d) A request from a local government or other government entity acting in its capacity to conduct site assessments for project or planning purposes;

(e) A removal-fill authorization application, request for a pre-application meeting or a compliance investigation;

(f) A request to review and approve a wetland determination or delineation report (see additional requirements and procedures in 141-090-0030 and 141-090-0035); or

(g) In conjunction with its authority and responsibilities under ORS 196.600 to 196.962, ORS 196.800 to 196.990 and any applicable rules of the Department.

(3) The Department may prioritize the completion of determinations based upon the availability of staff and budget resources.

(4) A request to the Department to provide a determination apart from an authorization application or local government notice shall include:

(a) A written request including landowner/agent permission to conduct a site visit;

(b) Landowner or agent name, company or agency, mailing address and phone number;

(c) A location map such as a city map showing the precise parcel location with respect to nearest streets and parcel address, if any;

- (d) A detailed site map such as a tax map or hand drawn parcel map showing, as appropriate, such features as the location of streets, roads, buildings, streams, and area of any planned development or fill or excavation, if known; and
- (e) The legal location from the tax map (Township, Range, Section, Quarter Quarter Section and Tax Lot numbers).
- (5) A request for a determination may include additional helpful information, such as:
 - (a) A large scale topographic map of the site (e.g., 1 inch = 50 feet);
 - (b) A large scale aerial photograph of the site; or
 - (c) Photographs of the site.
- (6) The Department will review the information provided with the request along with other available maps and information and provide a PJD or a JD.
- (7) The Department may request additional information and/or conduct a site visit to ensure an accurate determination. The Department shall contact the applicant or primary contact prior to conducting a site visit.
- (8) An Onsite JD conducted by the Department shall include at a minimum:
 - (a) A location map showing the location of the parcel(s) with respect to major roads;
 - (b) A parcel map showing property boundaries;
 - (c) The legal location from the tax map (Township, Range, Section, Quarter Quarter Section and Tax Lot numbers).
 - (d) The NWI map or, if available, the LWI map with the site located;
 - (e) The county soil survey map with site located and soil type(s) mapped on the site identified;
 - (f) A sketch map showing the approximate location of any waters of the state on the parcel(s);
 - (g) At least one data form (or equivalent notes) documenting any wetlands identified or possible wetlands determined not to meet wetland criteria; and
 - (h) Conclusions and recommendations regarding additional requirements (e.g., the need for a delineation or permit), as appropriate to the determination request and the situation.
- (9) After review of the information and the site visit, if conducted, the Department may:
 - (a) Provide a written PJD or JD in accordance with Subsection (10) of this section; or
 - (b) Provide a written PJD and recommend that the landowner, agent or applicant obtain a wetland determination and/or delineation that meets the requirements in 141-090-0030 and 141-090-0035.
- (10) A written PJD or JD by the Department shall include at a minimum:
 - (a) A letter or form addressed to the applicant, landowner or agent that includes the location of the parcel(s) investigated, a file number for future reference, and the expiration date of the JD, or a response on or attached to a wetland land use notice form or other site development notice submitted by a local government; and
 - (b) Comments regarding the precision or use of the PJD or JD, as appropriate;
 - (c) Additional requirements or recommendations, such as the need for a wetland delineation;
 - (d) A determination of the requirements or exemptions in accordance with OAR 141-085, OAR 141-089, OAR 141-0100 and OAR 141-0102 that apply to any waters of the state identified on the parcel(s) and/or the proposed activity, if the information provided to or obtained by the Department is sufficient to make such determination; and

(e) A map or reference to a map showing the parcel(s) investigated and the approximate location and boundaries of any waters of the state identified on the parcel(s), unless the information provided to or obtained by the Department is not sufficient to make or refer to such a map.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0030

Technical Requirements

(1) Wetland determinations and delineations shall be conducted in accordance with the 1987 U.S. Army *Corps of Engineers Wetlands Delineation Manual* ("the manual") along with any supporting technical or guidance documents issued by the Department and applicable guidance issued by the U.S. Army Corps of Engineers for the area in which the wetlands are located.

(2) In addition to the requirements in this section, wetland determination and/or delineation reports submitted to the Department for review and approval shall meet the standards and requirements in 141-090-0035.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0035

Standards and Requirements for Wetland Determination and Delineation Reports Submitted to the Department

(1) **General Requirements:** All wetland determination and/or delineation reports ("reports") submitted to the Department for review, approval and a JD shall meet the technical requirements in 141-090-0030 as well as the minimum standards and requirements in this section.

(2) All wetlands or other waters on the parcel or study area shall be included; the Department will determine whether or not they are "waters of the state" subject to jurisdiction under OAR 141-085, OAR 141-089, OAR 141-0100 and OAR 141-0102.

(3) All reports shall include the following sections:

(a) A fully completed "Wetland Delineation/Determination Report Cover Form" (form provided by the Department);

(b) Text as described in subsection (8) of this section;

(c) Maps as described in subsections (9) through (14) of this section;

(d) Data forms as described in subsections (15) and (16) of this section; and

(e) Appendices, as needed.

(4) All report text, maps, aerial photographs and data forms must be legible and, with the exception of aerial photographs, must copy legibly on a black and white copier.

(5) If a wetland function and condition evaluation is conducted, the methods and results of that evaluation should be presented in a separate section of the report or in a separate document.

(6) All reports shall include:

- (a) The name, address, phone number, fax number and e-mail (if any) of the landowner;
- (b) The name, address, phone number, fax number and e-mail (if any) of the applicant, if different;
- (c) The address or, if no address is assigned, the approximate location of the site investigated, including county and city if within a city limits;
- (d) The tax map number including the Township, Range, Section(s), Quarter Quarter Section(s), and Tax Lot(s) of the parcel(s) covered by the report;
- (e) The latitude and longitude of the centroid of the parcel(s) or the start and end points of a linear project;
- (f) The name, address, phone number, fax number, and e-mail address of the person that prepared the report; and
- (g) Permission in writing from the landowner or agent, or a duly authorized representative of the landowner or agent, for the Department or its authorized representative to conduct a site visit.

(7) Reports may include, or the Department may in some circumstances require:

- (a) Aerial photographs;
- (b) Photographs of the site;
- (c) A detailed topographic survey of the site; and
- (d) Additional information regarding site history or field indicators helpful to evaluating the site and making a JD.

(8) **Text Requirements:** The report text shall include, in addition to the elements in subsection (6) of this section:

- (a) A detailed description of the site, its landscape setting, and previous and current land uses;
- (b) A description of any wetlands, including whether or not they extend offsite, and the characteristics of the wetland/non-wetland boundaries on the site;
- (c) A description, approximate year, and analysis of any site alterations that likely affected the presence, location or geographic boundaries of any waters of the state on the site (e.g., surface drainage ditches or fill material);
- (d) The site-specific methods used to conduct the field investigation, select sample plot locations, and make the PJDs;
- (e) The methods and rationale used to determine the boundaries of any wetlands on the site;
- (f) The wetland map accuracy (see subsection 12 of this section);
- (g) The methods used to determine the geographic extent of other waters of the state (e.g., ordinary high water);
- (h) The date(s) of the field investigation(s);
- (i) The precipitation on the day of and immediately preceding (approximately 1 to 2 weeks) the date(s) of the field investigation(s) and percent of normal rainfall for the water year to date;
- (j) The results and conclusions of the investigation; and
- (k) The following statement: "This report documents the investigation, best professional judgment and conclusions of the investigator. It is correct and complete to the best of my knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and

approved in writing by the Oregon Department of State Lands in accordance with OAR 141-090-0005 through 141-090-0055."

(9) **Map Requirements:** All reports shall include the following maps:

(a) A location map, such as city map, showing the precise site location;

(b) A tax lot map showing the entire parcel(s);

(c) The appropriate LWI map showing the site location and boundaries, or if no LWI has been completed, the NWI map(s), including map name(s), showing the site location and boundaries;

(d) The county soil survey map, if published, showing the site location and boundaries and including a legend identifying the sheet number and all soil series mapped on the site; and

(e) One or more wetland maps comprising the wetland determination and/or delineation that shows parcel and/or study area boundaries and tax lot number(s), includes all waters of the state on the site, and meets the additional requirements in subsections (10) through (14) of this section.

(10) The wetland map(s) shall be at a scale suitable for the site size and for legibility. For most purposes, an appropriate map scale is 1 inch = 100 feet. For large sites or projects, a scale of 1 inch = 200 feet or smaller is preferable. Minimum map scale for a JD and/or for permitting purposes is subject to Department approval.

(11) The wetland map(s) shall at a minimum include:

(a) The boundaries of the entire parcel(s) subject to investigation; or

(b) If only a portion of the parcel(s) was investigated, the study area boundary in relation to the parcel boundaries; and

(d) Existing structures (unless shown on a current aerial photo included in the report), areas of fill, water diversions, or other major alterations;

(d) All water features and their boundaries;

(e) Numbered sample plots corresponding to data forms (see subsections (15) and (16) of this section);

(f) North arrow and scale bar; and

(g) Photograph locations and direction of view, if photographs are included in the report.

(12) The wetland map(s) and the report text shall indicate whether the location of the parcel boundaries and waters of the state depicted on the map are approximated, measured from known points visible on the map or on an aerial photo included with the report, mapped using a GPS, or professionally land surveyed, and shall include the estimated accuracy of the mapping (in feet) relative to the actual location of the boundaries on the ground. The estimated map accuracy should reflect both the precision of the field work and the precision of the mapping (i.e., using the map, how accurately could a person relocate the wetland boundary?). If mapping was done using a GPS, provide the post-processing error estimate for the mapping precision.

(13) The appropriate or necessary degree of map accuracy is dependent upon a variety of factors including, but not limited to, the size and complexity of the site and whether the map is provided as part of a wetland determination (showing approximate wetland location) or a wetland delineation. A very precise wetland delineation map prepared by a registered professional land surveyor or by a trained person using a mapping or survey grade GPS is generally needed for such activities as subdivision planning and removal-fill permitting.

(a) The level of map detail and accuracy must be substantiated by a corresponding level of field investigation and data collection detail (See subsection 17 of this section).

(b) The appropriate level of map accuracy for removal-fill permitting is subject to the judgment of the Department.

(c) The Department may condition its approval of a report to reflect the Department's judgment of map accuracy and suitability (see Subsection 10).

(14) The wetland map may be hand drawn or computer assisted. For large sites, the wetlands and other waters identified may be mapped onto a large scale aerial photograph (to be included in the Report) but must also be accurately transferred to a drawn map (as described in subsections (11) and (12) of this section) unless otherwise authorized by the Department.

(15) **Data Form Requirements:** All reports shall include a wetland determination data form for each sample plot. The data form used must be that provided by the Department or, if a customized data form is used, it must include all of the information contained on the Department prescribed data form and be clearly laid out in a similar format.

(16) All wetland determination data forms must:

(a) Be fully completed;

(b) Include only data collected from a single sample plot on a single date (additional dates of hydrology data may be reported in the comments section);

(c) Include the Latin botanical name and percent cover of all plant species listed;

(d) Use the 50/20 method (as described in the on-line edition of the Manual) for determining dominant plant species;

(e) Use standard soils terminology and abbreviations as established by the U.S. Department of Agriculture, Natural Resources Conservation Service; and

(f) Include the depth range below ground surface (dug to at least 16 inches) of soils and hydrology features noted (e.g., 0-3 inches, 3-8 inches, 8-16 inches).

(17) **Field Methods:** The field investigation methods and level of detail required for making and documenting a PJD or JD and mapping waters of the state is dependent upon site size, complexity and disturbance history, and on whether atypical situations or problem areas are encountered. At a minimum:

(a) The entire parcel (tax lot) or project area must be investigated during a field investigation. If only a portion of a parcel or project area is investigated, that must be made clear in the report text and on the wetland maps.

(b) All waters of the state in addition to wetlands must be identified, described, supported by data as appropriate, and mapped.

(c) Sufficient data and additional information shall be collected for any waters of the state to enable the Department to make an JD and also to determine if removal-fill permit requirements apply or if the water identified may be specifically exempt from permit requirements.

(d) Wetland delineation data must include a sample plot that best represents the characteristics of each wetland present (minimum of one plot per wetland); a sample plot that best represents adjacent non-wetland(s); and paired sample plots located close enough to either side of the wetland boundary (e.g. 4 (four) feet apart) to substantiate the wetland boundary location.

(e) Wetland determination data must be provided for any site or portion of a site where there is significant deviation from wetlands mapped on the NWI or LWI. Note in the

report text if the deviation is due to development of the area mapped as wetland on the NWI or LWI, thus precluding data collection.

(f) If the site does not contain wetlands, at least one sample plot must be placed in the lowest topographic area or other location most likely to contain wetlands to document site conditions.

(18) If a wetland boundary is long or irregular in shape, paired data points sufficient to accurately identify and substantiate the wetland boundary are required; for a very irregular wetland boundary, several pairs of plots may be required. If the wetland boundary can be determined based upon one set of paired data points and a defined break in slope or other clearly visible features, that information must be fully described in the report text.

(19) Parcel boundaries, wetland boundaries and sample plots shall be identified on the ground with numbered stakes, flags, spray paint or similar markers, and/or identified on an aerial photo and/or the wetland map, such that the boundaries and sample plots can be readily relocated in the field during a site visit by the Department.

(20) Because sites are highly variable and JD needs also vary, there are many potential situations where minimal field documentation may be acceptable (e.g., linear projects covering extremely large geographic areas), where non-standard field documentation and wetland mapping may be appropriate (e.g., intricate wetland/non-wetland mosaics), or where more intensive sampling may be required (e.g., an atypical site). In such situations, persons conducting wetland delineations are encouraged to consult with the Department regarding appropriate methods.

(21) Depending on site conditions and circumstances, additional information that may be required to establish state jurisdiction includes, but is not limited to:

(a) Documentation of fish presence or absence in a stream or ditch, using published maps or reports or information from an authoritative source (e.g., Oregon Department of Fish and Wildlife field staff);

(b) Data sufficient to determine whether or not an identified water area is artificially created entirely from upland and/or the purpose for which it was created;

(c) hydrology monitoring data;

(d) Historical aerial photographs;

(e) Extent and date of site alterations;

(f) Data or other information on pre-disturbance conditions, such as excavation to an original (unfilled) soil surface or identification of a former stream course;

(g) Data collected at a certain time of year;

(h) Additional plant species identification; or

(i) More rigorous field sampling methodologies.

(22) **Short Report Option:** An abbreviated wetland determination process and short report format may be used in lieu of the requirements in subsections (3) through (21) of this section for reporting the results of a PJD on very small parcels or study areas (one-quarter acre or smaller) according to the following conditions and requirements:

(a) There are no wetlands or other waters mapped on the NWI or LWI for the parcel, the parcel has not been farmed or recently disturbed in any way that would obscure wetland indicators, and in the judgment of the investigator the parcel is clearly non-wetland in its entirety and contains no other potential waters of the state.

(b) The report includes:

(A) A fully completed "Wetland Determination Form for Small Parcels With No Wetlands" (form provided by the Department) and all map attachments listed on the form; and

(B) At least one completed data form reporting data collected at the lowest topographic area on the site or other area most likely to meet wetland criteria based upon soils mapping, vegetation or other characteristics and indicators. The plot location must be shown on the parcel map.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0040

Procedures for Review and Approval of a Wetland Determination or Delineation Report Submitted to the Department for a Jurisdictional Determination

(1) When a wetland determination or delineation report is submitted to the Department for review, approval and a JD, the Department shall review the report (according to its established priorities) to ensure that:

(a) The work meets the technical requirements in 141-090-0030;

(b) The report meets the standards and requirements in 141-090-0035;

(c) There is sufficient information for the Department to make a JD, including the geographic extent of any waters identified, as appropriate; and

(d) There is sufficient information for the Department to determine the removal-fill authorization requirements or exemptions that apply to the wetlands or other waters identified and/or the activities proposed.

(2) During or upon completion of the Department 's review, the Department may take any of the following actions:

(a) Approve all or a portion of the report and PJD by providing a written JD to the landowner, agent or applicant and the consultant, if any, in accordance with 141-090-0025(9).

(b) Request missing information, clarification or additional data (see 141-090-0035(21)).

(A) The request will be made to the primary contact by telephone, e-mail or in writing.

(B) If the Department makes a written request to the primary contact, the Department will copy the request to the consultant, landowner and/or applicant, as appropriate.

(C) The primary contact shall be responsible for promptly informing the Department of any change in the primary contact during the Department 's review process.

(c) Conduct a site visit to confirm the report findings or obtain additional information (See 141-090-0025(6));

(d) Revise the wetland map and/or the PJD based upon the report review, any additional information requested, and/or a site visit, and provide a JD accordingly after consulting with the primary contact and report author, if different; or

(e) Reject the report, along with a written explanation to the primary contact, without further review or approval, if:

(A) The work has not been completed according to the technical requirements in 141-090-0030;

(B) The report does not meet the standards and requirements in 141-090-0035;

(C) The report does not, in the judgment of the Department, accurately reflect site conditions or provide sufficient information for a JD; or

(D) Additional or clarifying information, permission for a site visit, or requested revisions are not provided within 120 calendar days of the Department's written request.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0045

Duration, Expiration and Reissuance of Jurisdictional Determinations

(1) All JDs by the Department shall be in writing and shall remain valid for a period of not more than five years from the date of issuance unless:

(a) A field investigation or new information reveals that site conditions and/or the geographic extent of waters of the state are not consistent with the information in a report or permit application submitted to the Department;

(b) Additional site information or data is provided voluntarily by an applicant or landowner to the Department;

(c) Additional information is provided to or obtained by the Department in conjunction with a request for reconsideration (141-090-0050) or a contested case hearing associated with an authorization application (ORS 196.825(6) and OAR 141-085-0075);

(d) Information is provided to or obtained by the Department in conjunction with an appeal to the U.S. Army Corps of Engineers of an Approved Jurisdictional Determination (33 CFR Parts 320, 326 and 331); or

(e) New information obtained by or provided to the Department shows a change in circumstances resulting in a change in the jurisdictional area.

(2) Upon expiration, a JD is no longer valid for purposes of the Removal-Fill Law.

(3) An expired JD may be reissued upon written request from the landowner or agent to the Department.

(4) Information required for reissuing a JD shall include at a minimum:

(a) Onsite re-inspection by Department staff and/or another person to determine if there has been any change in circumstances.

(b) If no change in circumstances is found, a short report noting or including:

(A) A fully completed Wetland Delineation/Determination Report Cover Form, unless the inspection is conducted by the Department;

(B) The date of the most recent field inspection;

(C) The name of the person conducting the field inspection;

(D) The precise area inspected (e.g., tax lot or portion of tax lot);

(E) Description of site conditions and any changes between the date of the original wetland determination or delineation and the date of the re-inspection;

(F) Any additional maps, aerial photographs or other documents consulted; and

(G) Conclusions regarding the accuracy of the original JD.

(c) If a change in circumstances is noted, the information in subsection (4)(b) of this section shall be provided along with:

(A) Additional field data, including wetland determination data in conformance with OAR 141-090-0035(15) and (16), needed to verify and document any change in the

jurisdictional status or extent of waters of the state that were or were not identified and mapped as part of the original jurisdictional determination;

(B) A revised wetland map that meets the requirements in OAR 141-090-0035(9)(e); and

(C) Data, documentation, and other information as needed to establish the nature and timing of the activity or activities that resulted in the change in circumstances, particularly if fill or excavation has occurred.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0050

Request for Reconsideration

(1) A JD by the Department may be reconsidered upon written request to the Department by the applicant, landowner or agent within sixty (60) calendar days of the date of the JD (date the letter or form was signed by the Department). The request for reconsideration initiates an informal review process.

(2) New information may be provided by the applicant, landowner, agent or the Department, or may be requested by the Department.

(3) A reconsideration may result in a modified JD or in the reaffirmation of the original JD.

(4) In the event that the applicant, landowner or agent disagrees with the reconsideration decision, he or she may initiate a contested case proceeding pursuant to ORS 183.413 through 183.470.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

141-090-0055

Effective Date

These rules become effective immediately upon filing with the Secretary of State.

Stat. Auth.: ORS 196.845 & ORS 196.692

Stats. Implemented: ORS 196.800 – ORS 196.990, ORS 196.600 – ORS 196.665, ORS 196.668 – ORS 196.692 & ORS 197.279

Oregon Department of State Lands
Wetland Determination/Delineation Report Requirements Checklist
OAR 141-090-0005 to 0055

(This form summarizes requirements and is not meant to replace the above rules. This form is an aide and its use is optional.)

Report Name: _____ County: _____ WD # _____

Consultant firm/contact: _____ Firm's Project No.: _____

Technical Requirements:

- Work conducted according to 1987 *Corps of Engineers Wetland Delineation Manual* and supporting technical documents & guidance

General Requirements:

- All wetlands and other waters of the state present on the site are included
 - Report contains the required sections (text, maps, data forms)
 - All text, maps, aerials, and data forms are legible; all but photo will copy on B&W copier
 - Wetland Determination/Delineation Report Cover Form
 - Name, address, phone & fax number, and email address of landowner
 - Name, address, phone & fax number, and email address of applicant if different
 - Name, address, phone & fax number and e-mail address of firm/person that prepared report
 - Address or, if none, location of site, including county and city (if within city limits)
 - Tax map number (TRS QQ Section and Tax Lot Number(s))
 - Latitude & Longitude (centroid, or beginning & end of linear project)
 - Delineation Purpose checked
 - Signatures
-

Text Requirements:

- Detailed description of the site, its landscape setting, and previous and current land uses
 - Description of any wetlands, including whether or not they extend offsite, and the characteristics of the wetland/non-wetland boundaries
 - Description, approx. year, and analysis of any site alterations that likely affected the presence, location or boundaries of any waters of the state on the site
 - The site-specific methods and rationale used to conduct the field investigation, select sample plot locations, determine wetland boundaries, determine the geographic extent of other waters of the state
 - Date(s) of the field investigation(s)
 - The wetland map accuracy (see below)
 - Precipitation on the day of approximately 1 to 2 weeks before the date(s) of the field investigation(s) and percent of normal rainfall for the water year to date
 - Results and conclusions
 - The required disclaimer
-

Map Requirements:

- Location map showing the precise site location
- Tax Lot map showing the entire parcel(s)

Map Requirements, cont.:

- LWI map, or if no LWI has been completed, NWI map(s), including map name(s), showing the site location and boundaries (web-source NWI map must include all wetland/deepwater features)
 - County soil survey map showing the site location and boundaries and including a legend identifying the sheet number and all soil series mapped on the site
 - One or more wetland maps comprising the wetland determination and/or delineation and includes:
 - The boundaries of the entire parcel(s) subject to investigation; or
 - If only a portion of the parcel(s) investigated, the study area boundary in relation to the parcel boundaries
 - Existing structures (unless shown on a current aerial photo included in the report), areas of fill, water diversions, or other major alterations
 - All water features and their boundaries
 - Numbered sample plots corresponding to data forms
 - North arrow and scale bar
 - Photograph locations and direction of view, if photographs are included in the report
 - The wetland map(s) scale is suitable for the site size and for legibility
 - The wetland map(s) and the report text indicate how wetland boundaries were mapped and the estimated map accuracy.
-

Data Form Requirements:

- Fully completed data form for each sample plot
 - Standard NRCS soils terminology & depth range of soils and hydrology features recorded
 - Latin name of plant species listed
 - 50/20 method used to determine dominant species
-

Field Methods:

- Data includes a sample plot that best represents each wetland; a sample plot that best represents adjacent non-wetland(s); and paired sample plots located close enough to either side of the wetland boundary to substantiate the wetland boundary location
 - Data is provided for any site or portion of a site where there is significant deviation from wetlands mapped on the NWI or LWI; significant difference is explained in text
 - If the site does not contain wetlands, at least one sample plot was placed in the lowest topographic area or other location most likely to contain wetlands to document site conditions.
 - If needed to establish state jurisdiction:
 - Documentation of fish presence or absence in a stream or ditch, using published maps or reports or information from an authoritative source (e.g., ODFW)
 - Data sufficient to determine whether or not an identified water area is artificially created entirely from upland and/or the purpose for which it was created
 - Hydrology monitoring data
 - Historical aerial photographs
 - Data or other information on pre-disturbance conditions
-
-

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form constitutes a request for a jurisdictional determination by the Department of State Lands. It must be fully completed and signed, and attached to the front of reports submitted to the Department for review and approval.

**Wetlands Program Manager/Oregon Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279**

<input type="checkbox"/> Applicant <input type="checkbox"/> Owner Name, Firm and Address:	Business phone # Home phone # (optional) FAX # E-mail:
<input type="checkbox"/> Authorized Legal Agent, Name and Address:	Business phone # FAX # E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: _____ Signature: _____
 Date: _____ Special instructions regarding site access: _____

Project and Site Information (for latitude & longitude, use centroid of site or start & end points of linear project)

Project Name:	Latitude:	Longitude:		
Proposed Use:	Tax Map #			
Project Street Address (or other descriptive location):	Township	Range	Section	QQ
	Tax Lot (s)			
City:	County:	Waterway:	River Mile:	
		NWI Quad(s):		

Wetland Delineation Information

Wetland Consultant Name, Firm and Address:	Phone #
	FAX #
	E-mail address:

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: _____ Date: _____

Primary Contact for report review and site access is Consultant Applicant/Owner Authorized Agent

Wetland/Waters Present? Yes No Total Wetland Acreage: _____

Delineation Purpose:

<input type="checkbox"/> R-F permit application submitted with delineation <input type="checkbox"/> Mitigation bank site <input type="checkbox"/> Industrial Land Certification Program site <input type="checkbox"/> R-F application will be submitted within 90 days	<input type="checkbox"/> Sale, purchase, lease etc. <input type="checkbox"/> Partition, re-plat, lot line adjustment <input type="checkbox"/> Habitat restoration project <input type="checkbox"/> Other:
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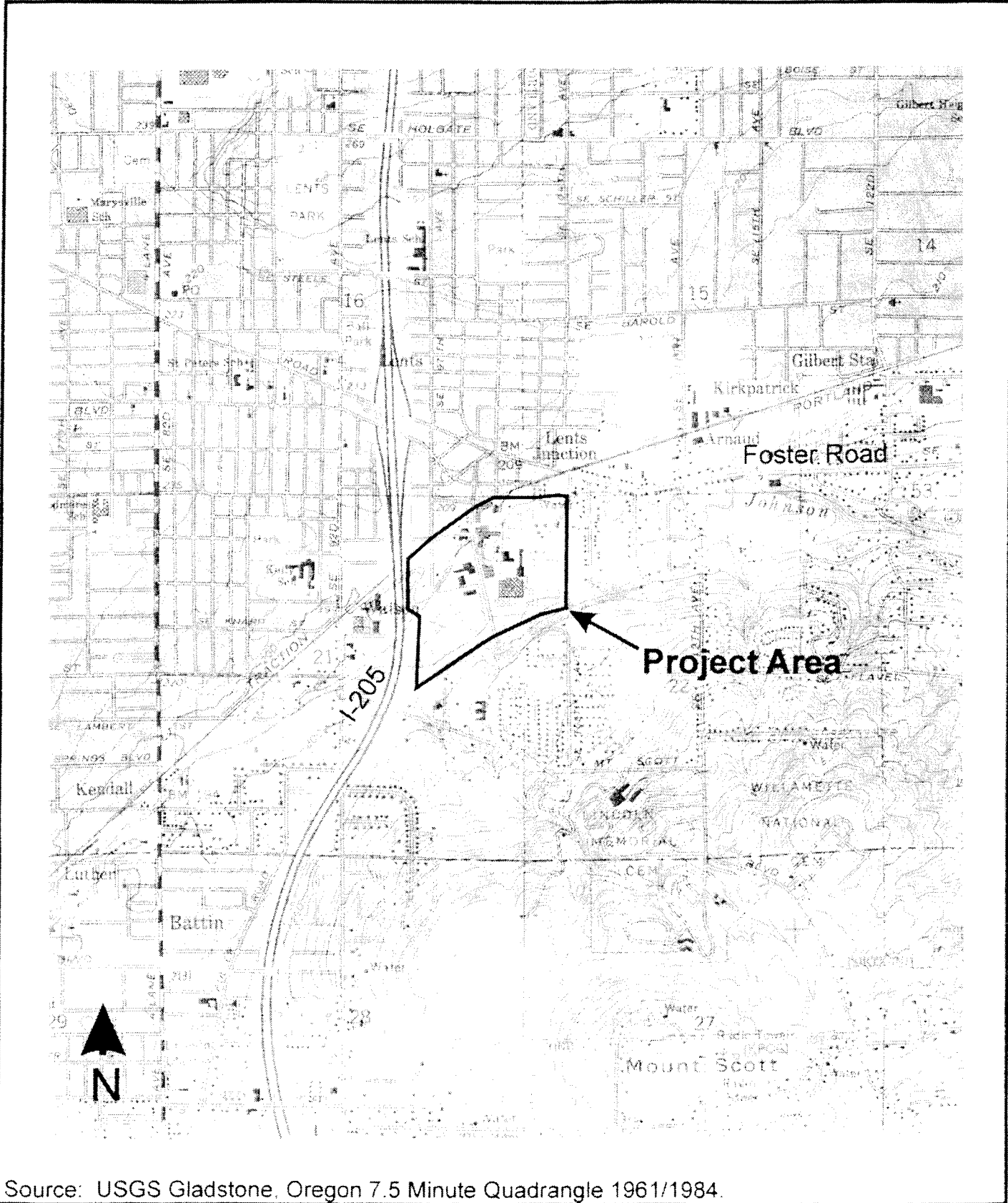
Other Information:

Has previous delineation/application been made on parcel?	Y	N	If known, previous DSL #
Does LWI, if any, show wetland on parcel?	<input type="checkbox"/>	<input type="checkbox"/>	LWI wetland code:

For Office Use Only

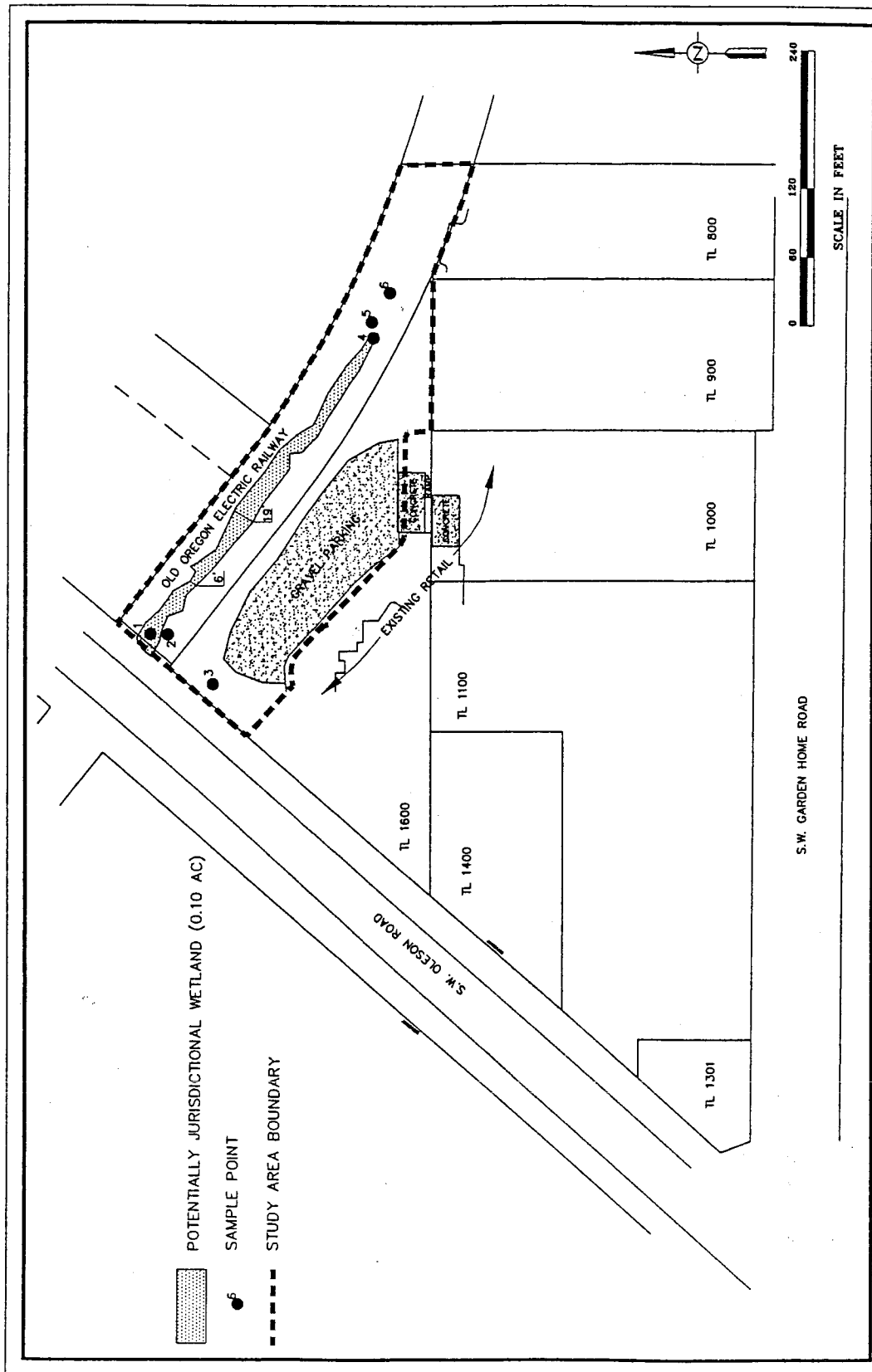
DSL Reviewer: _____	Report Tier: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	DSL WD # _____
Date Delineation Received: ____ / ____ / ____	DSL Project # _____	DSL Site # _____
Scanned: <input type="checkbox"/> Final Scan: <input type="checkbox"/>	DSL WN # _____	DSL App. # _____

Appendix B: Example of a Good, Specific Site Location Map



Source: USGS Gladstone, Oregon 7.5 Minute Quadrangle 1961/1984.

Appendix B: Example of Map Showing Study Area Within Larger Tax Lot



Appendix C: Effective Use of Site Photographs



Location: Harbor Bay Furniture property in Lincoln City, Oregon. Looking east from west. Note dividing line between wetland area and upland slope to the buildings. *Lysichiton americanum* in foreground (wetland) and Himalaya blackberry (*Rubus procerus*) on uplands. The red dotted line divides the Wetland/upland areas.

May 16, '03; Lower Tupper Creek looking north (downstream) from the east edge of the wetland boundary.



Appendix D: Hints for Conducting Wetland Delineations on Cropped/Agricultural Land

This guidance is for conducting wetland delineations on cropped fields or managed pastures in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (The Manual), for purposes of the State Removal Fill Law or Section 404 of the Clean Water Act. These hints are intended to supplement The Manual and administrative rules on wetland delineation reports (OAR 141-090-0005 through 0055) adopted by the Department of State Lands (DSL).

In most cases, consultants are requested to delineate agricultural wetlands where the intent is to convert the land to a non-agricultural use (urbanizing land). In those cases, follow the *Atypical Situations* procedures in The Manual and also use the hints below.

- If possible, conduct field work during the early Spring when direct hydrology indicators can be used.
- Look for direct or indirect indicators of inundation or saturation at or near the surface—within the major root zone. Indicators found only at depths below 12 inches may not be sufficient to meet criteria. Take recent disturbance (plowing) that alters and obscures field indicators into consideration.
- Always use large scale aerial photographs to assist with the delineation. Use several different years and obtain spring photos if possible. Summer aerial photos generally are not adequate. Black and white spring photos are often excellent for locating saturated soils.
- Field indicators to use in conjunction with aerial photo interpretation include:
 - Microtopography—subtle swales; break in slope; drainage patterns; depressions.
 - Oxidized rhizospheres with live roots—these often re-establish themselves in a single season after plowing and planting.
 - Don't rely on concretions as a reliable hydrology indicator; they last a long time and can be imported by past flood events, so may only reflect historical conditions.
 - Algal mats, matted stems with sediment deposits, or similar evidence of ponding.
 - Crop stress due to wetness—be aware that other factors such as uneven fertilizer or irrigation rates can also cause crop stress.
 - Presence of hydrophytic weeds vs. non-hydrophytic weeds (but consider the season of last disturbance).
 - Evaluate the potential effect of site alterations such as extent and spacing of ditching, subsurface drainage, land leveling etc.
 - Note differential field treatment such as timing of plowing; different planting times, different crops (wet tolerant species like annual rye vs. less tolerant species), even fencelines (very often, the wet portions of fields are fenced off).
 - Landowner knowledge.

There are different procedures and criteria for the COE and the Natural Resources Conservation Service (NRCS) for delineations on agricultural land that will remain in agricultural use. Consult the *National Food Security Act Manual*, Operating Procedures, and Oregon off-site mapping standards referenced in the *Required Technical Documents* section (items 7-9 on page 5) of this guidance.

These highly altered sites can be very difficult and experience is important. If you lack experience with agricultural sites, work with others until you feel comfortable with the methodologies and indicators. Contact the wetlands specialists at DSL, the COE, or NRCS (if applicable) if you need advice.

Appendix E: WETS Tables for Precipitation Data and Growing Season Dates

Use the WETS data tables for the weather station closest to your site to evaluate your actual precipitation data with respect to “normal” conditions. This is extremely helpful information to know before you conduct your field work and is the best information for evaluating your field data. The following link takes you to the tables for Oregon. They are alphabetical by County; within each County file there are several weather stations.

<ftp://ftp.wcc.nrcs.usda.gov/support/climate/wetlands/or/>

Data for the OSU Station is provided as an example (next page). The first table provides long term data on the “normal range” for precipitation. We recommend that you use this data to determine whether the rainfall for any given month or prior months is within a normal range. A single, average figure is not very helpful in interpreting data. All you know is that your actual rainfall was higher or lower than “normal.” But, by using the table below, you can readily see if actual precipitation was within a normal range (a bell curve) and thus reflects “normal” conditions. For example, if your field work was done at the end of April and the actual precipitation for April was 3.1 inches, it is slightly higher than the average (2.98”) but is well within that 30-70 percentile normal range (2.09 to 3.53 inches) for April and you probably don’t have to adjust your methods or your data analysis.

In contrast, if your actual rainfall for April was 5.25 inches, you would know that your actual rainfall was well above the normal range and you may well have observed elevated water tables. Or, if your actual was 0.88 inches, it was well below normal range. It would also be important to look at the March data. If the precipitation is above or below the normal range for the month, and especially if it was also above or below for the prior month or two, you may need to adjust your data collection methods and your interpretation of your data. Adjustments made should be discussed briefly in the report and noted on the data forms.

The next table in WETS provides growing season dates for each weather station (refer to the 28 degrees F dates). This data is more accurate than the generalized dates in the soil surveys.

WETS Station : CORVALLIS STATE UNIV, OR1862 Creation Date: 09/09/2002
 Latitude: 4438 Longitude: 12312 Elevation: 00230
 State FIPS/County(FIPS): 41003 County Name: Benton
 Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)					
	avg daily max	avg daily min	avg	avg	30% chance will have		avg	# of	avg
					less than	more than	days w/.1 or more	total fall	
January	46.2	33.6	39.9	6.46	3.95	7.82	12	1.1	
February	50.4	35.4	42.9	5.71	3.91	6.80	12	2.1	
March	55.6	37.6	46.6	4.59	3.46	5.35	12	0.1	
April	60.2	39.9	50.0	2.98	2.09	3.53	8	0.0	
May	66.6	44.0	55.3	2.30	1.52	2.81	6	0.0	
June	72.9	48.5	60.7	1.46	0.93	1.76	4	0.0	
July	80.6	51.8	66.2	0.57	0.17	0.68	1	0.0	
August	81.7	51.5	66.6	0.73	0.08	0.86	2	0.0	
September	76.4	48.2	62.3	1.47	0.52	1.80	3	0.0	
October	64.8	41.8	53.3	3.02	1.70	3.68	7	0.0	
November	52.3	38.0	45.2	6.94	4.55	8.34	13	0.2	
December	45.7	33.8	39.8	7.43	5.03	8.88	12	1.3	
Annual					38.08	48.18	--	----	
Average	62.8	42.0	52.4				--	----	
Total				43.65			92	4.8	

GROWING SEASON DATES

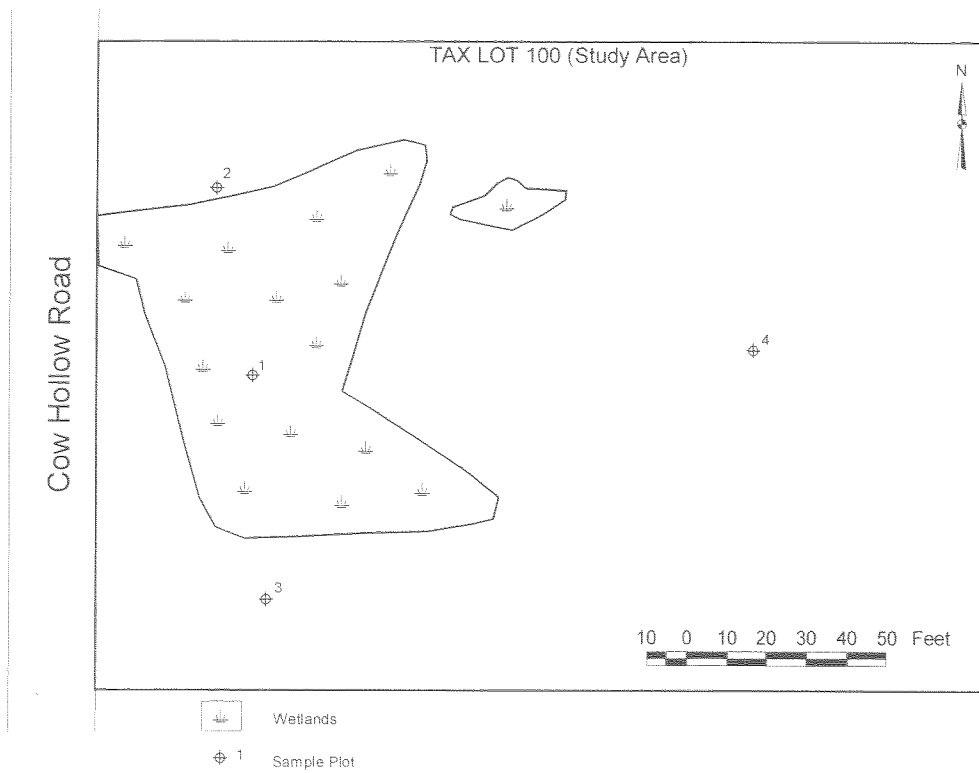
Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	1/17 to ---- 349 days	2/27 to 11/20 267 days	4/20 to 10/26 189 days
70 percent *	> 365 days > 365 days	2/16 to 12/ 1 289 days	4/13 to 11/ 2 203 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

Appendix F: Data Plot Location Examples

Example A: Unacceptable Data Plots

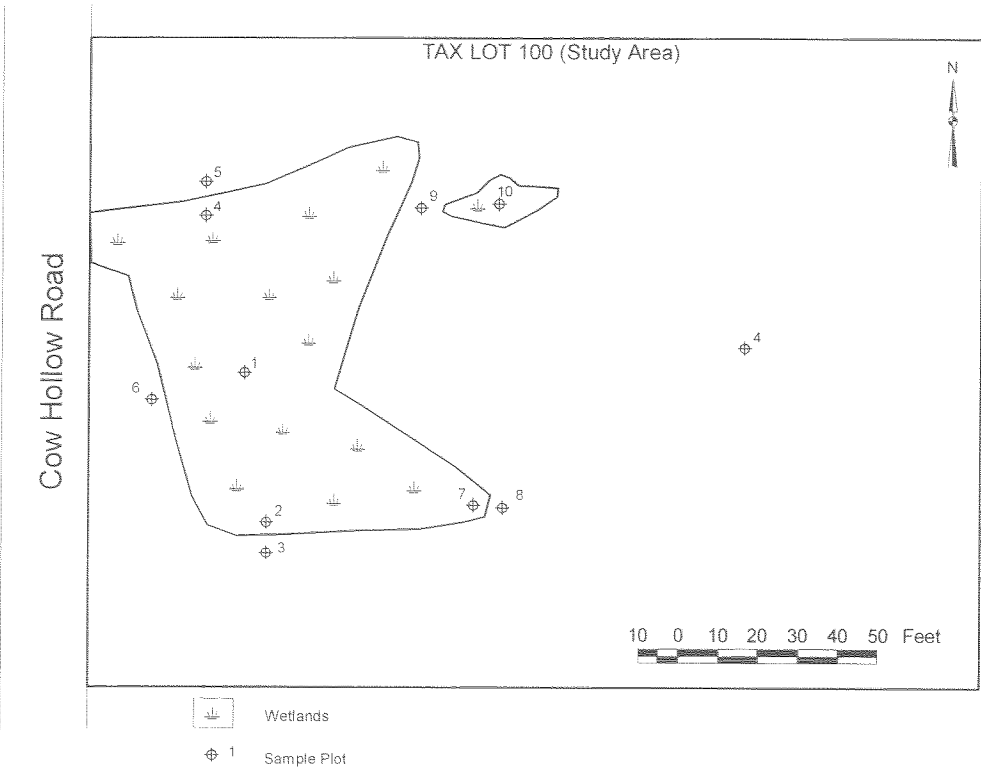
This delineation map is not sufficient because (a) one wetland has no data; (b) there are no paired plots with which to verify the wetland boundaries; (c) there is no data between the two wetlands to verify upland conditions in between; (d) there is no data that explains the straight wetland boundary on the south side.



Appendix F: Data Plot Location Examples

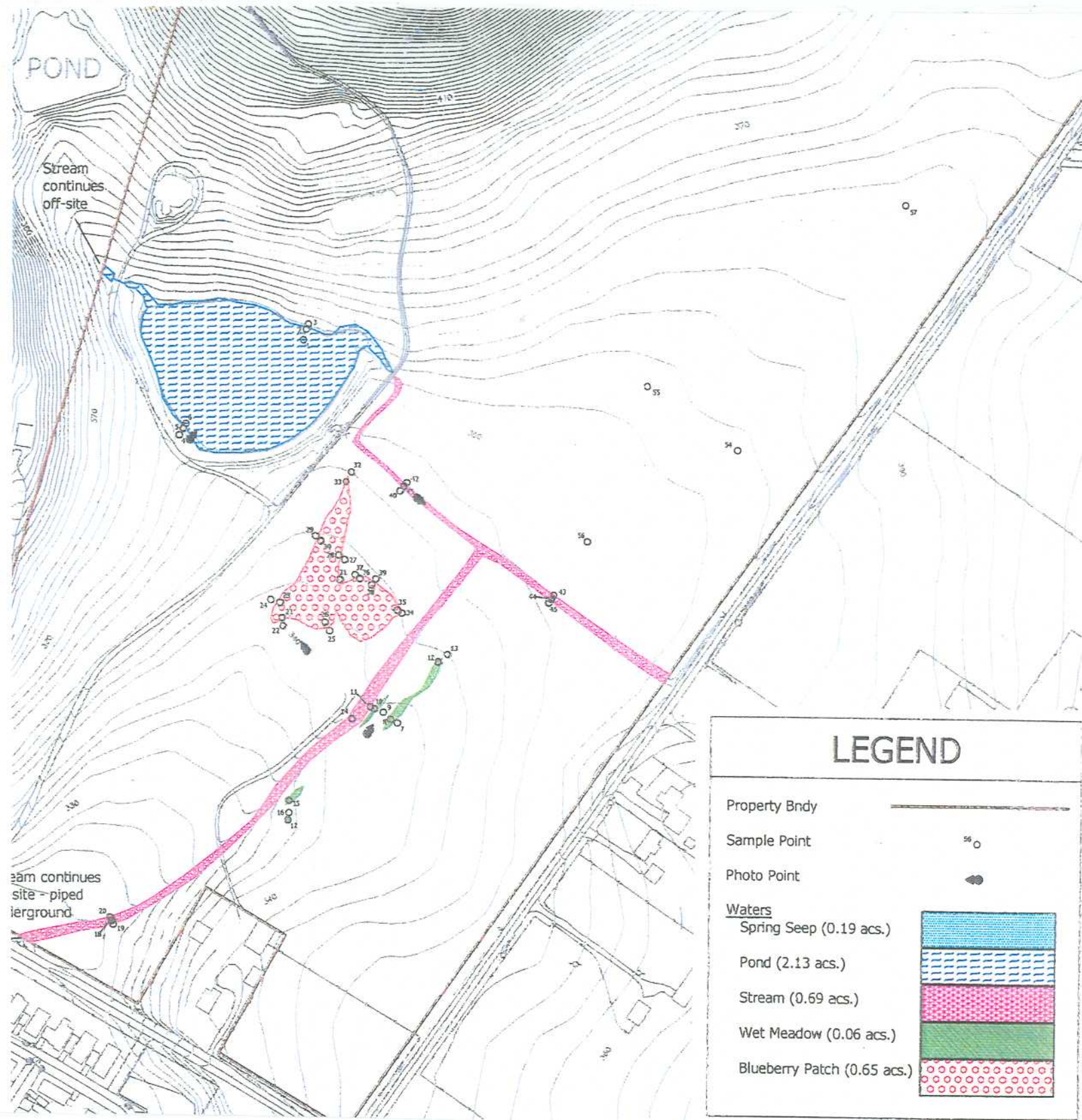
Example B: Acceptable Data Plots

The same map, showing an example of an acceptable number and location of data plots. What is sufficient and acceptable depends in large part on site topography, mapped soils and specific explanation in the report about the characteristics of the wetland boundaries.



Appendix F: Data Plot Location Examples
Example C: Appropriate Use of Paired Data Plots

In the next example, few paired plots are needed for the pond and streams, which are topographically defined. In contrast, the "blueberry patch" wetland is not topographically defined so paired plots were placed around the entire perimeter and between the wetland and other water features.



Appendix G: Problem Wetlands and Problem Soils

Some Problem Wetlands that Occur in Oregon

Playas—Playas are seasonal wetlands found in arid and semi-arid regions. They can be particularly difficult for wetland determinations because alkaline soils may show no or very weak redoximorphic features and they are often very sparsely vegetated. If basically unvegetated, they may be waters of the U.S./State rather than wetland.

Shallow Soil Wetlands—Wetlands formed in shallow soils over bedrock, fairly common on basalt ledges in the Columbia River gorge, can also be particularly difficult to identify. Soil formation is weak and hydric soil and hydrology indicators may be very weakly expressed. Depressions with sediment deposits and/or algal crusts may be the only hydrology indicators present most of the year.

Evergreen Forested Wetlands—Wetlands dominated by evergreen trees occur in parts of the Pacific Northwest. In some cases, the trees are FAC species, e.g., Engelmann spruce (*Picea engelmannii*), Sitka spruce (*P. sitchensis*) and lodgepole pine (*P. contorta*). In other cases, however, the dominant evergreen trees are FACU species, including ponderosa pine (*Pinus ponderosa*), western hemlock (*Tsuga heterophylla*), Pacific silver fir (*Abies amabilis*), white fir (*A. concolor*), and subalpine fir (*A. lasiocarpa*). In dense stands, these evergreen trees may preclude the establishment of understory vegetation or, in some cases, understory vegetation also includes FACU species. Since these plant communities are usually found on nonwetlands, the ones established in wetland areas may be difficult to recognize at first glance and are easily missed during the dry season. The landscape position of the evergreen forested areas—such as depressions, drainageways, bottomlands, flats in sloping terrain, and seepage slopes—should be considered because it often provides good clues to the likelihood of wetland hydrology. Soils also should be examined in these situations. Basically, the delineator will be looking for strong indicators of wetland hydrology and hydric soils.

Vegetated River Bars & Adjacent Flats—Along western streams in arid and semiarid parts of the country, some river bars and flats may be vegetated by FACU species while others may be colonized by wetter species. If these areas are frequently inundated for one or more weeks during the growing season, they are wetlands. The soils (usually Entisols) often do not have field indicators of hydric soils, and therefore they present delineation problems. Stream gauge data, if available, and/or local knowledge of flood frequency, timing and duration may be very important for making the wetland determination.

Dynamic Sites—Some areas, such as active floodplains, are regularly and often rapidly changing. These sites may have new soils without hydric soil field indicators, “historic” hydric soils, recent wetland hydrology, recently-removed hydrology, dominant vegetation that reflects previous hydrologic conditions, and numerous other potential confusions. In most instances, the delineator must determine whether or not an area currently meets wetland criteria. When dealing with riverine or floodplain sites, it may be necessary to obtain stream gauge data or conduct

hydrologic monitoring during the appropriate time period to determine if field indicators like scouring or sediment deposits represent sufficient duration of surface hydrology.

Vegetated Flats—Vegetated flats are typically found around lake margins or other water bodies with a strong seasonal hydrology change and are characterized by a marked seasonal periodicity in plant growth. They are dominated by annual OBL species and/or perennial OBL species such as *Carex lyngbyei* that have nonpersistent vegetative parts that break down rapidly during the winter. During winter and early spring, these areas lack vegetative cover and resemble mud flats; therefore, they do not appear to qualify as wetlands. But, during the growing season the vegetation becomes increasingly evident, qualifying these areas as wetland. In evaluating these areas, which occur both in coastal and interior locations, consider the time of year and seasonality of the vegetation.

Newly Created Wetlands—Includes manmade (artificial) and beaver-created and other natural wetlands. Artificial wetlands may be purposely or accidentally created by human activities (e.g., road impoundments, undersized culverts, irrigation, and seepage from earth-dammed impoundments). Many of these areas will have indicators of wetland hydrology and hydrophytic vegetation, but the area may lack typical field characteristics of hydric soils, since the soils have just recently been inundated and/or saturated. Since all these wetlands are newly established, field indicators of hydric soils and/or hydrophytic vegetation may not be present.

Additional Information on Some Problem Soils

Entisols—Entisols are recently formed soils that have little or no evidence of pedogenically developed horizons. These soils are typical of floodplains throughout the U.S., but may be found along tidal waters, and in other areas. They include sandy soils of riverine islands, bars, and banks and finer-textured soils of floodplain terraces. Wet entisols have an aquic or peraquic moisture regime and are considered hydric soil, unless effectively drained. Wet sandy entisols (with loamy fine sand and coarser textures in horizons within 20 inches of the surface) may lack sufficient organic matter and clay to develop hydric soil colors. When these soils have a hue between 10YR and 10Y and distinct or prominent mottles are present, a chroma of 3 or less is permitted to identify the soil as hydric (i.e., an aquic moisture regime). Also, hydrologic data showing soils criteria #3 or #4 (ponded or flooded for long or very long duration) are met are sufficient to verify these soils as hydric.

Spodosols (evergreen forest soils)—Oregon has a number of these type soils which are usually associated with coniferous forests. Spodosols have a gray eluvial E-horizon overlying a diagnostic spodic horizon of accumulated organic matter and aluminum. A process called podzolization is responsible for creating these two layers. Organic acids from the leaf litter on the soil surface are moved downward through the soil with rainfall, cleaning the sand grains in the first horizon then coating the sand grains with organic matter and iron oxides in the second layer. To the untrained observer, the gray leached layer may be mistaken as a field indicator of hydric soil, but if one looks below the spodic horizon the brighter matrix colors often distinguish nonhydric spodosols from hydric ones. The wet spodosols usually have thick dark surface horizons, dull gray E-horizons, and low chroma subsoils.

Mollisols—Mollisols are dark colored, base-rich soils. They are common in Oregon. These soils typically have deep, dark topsoil layers (mollic epipedons) and low chroma matrix colors to considerable depths. They are rich in organic matter.^[VGC1] The low chroma colors of mollisols are not necessarily due to prolonged saturation, so be particularly careful in making wetland determinations in these soils. Become familiar with the characteristics of mollisols with aquic moisture regimes, since they are usually hydric, and be able to distinguish them from nonhydric mollisols.

**Appendix H: Vegetation—Determining Dominant Species, the 50/20 “Rule”
and Data Forms**

50/20 “Rule” for Selecting Dominant Plant Species

“For each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for the stratum, plus any additional species that individually comprise 20% or more of the total dominance measure for the stratum. The list of dominant species is then combined across strata.”
(See User Notes in Corps Manual, Part III Sec. 30)

Note: This is a two step process:

Step 1: Calculate which species are dominants in each stratum (“50/20 Rule”)

Step 2: Combine dominants from all strata to count if more than 50% of the dominants are FAC, FACW and/or OBL. (“Basic Rule”)

Examples A through C on the following pages take you through Step 1. Examples D through G take you through both steps.

Selection of Dominant Plants Using 50/20 Method

Example A shows how to take your raw % cover data, convert it to 100% total cover for the stratum, and then apply the 50/20 rule on that “normalized” data. Example B shows a shortcut method that eliminates the need to convert the data to 100% cover. It’s quicker to do in the field. Use whichever method you prefer.

Example A: Full Method

Plant Species: Herb Stratum	Raw % Cover	Relative % Cover
<i>Carex obnupta</i> *	25	33*
<i>Geum macrophyllum</i> *	15	20*
<i>Poa trivialis</i> *	15	20*
<i>Carex unilateralis</i>	10	13
<i>Potentilla gracilis</i>	5	7
<i>Agrostis tenuis</i>	5	7
Stratum Cover:	75	100
Bare ground	25	
* = Dominant		

To convert the raw data above to relative % cover, divide the raw % cover of each species by the stratum cover. For CAOB, $25 \div 75 = 33$. The end result should come out to 100% total cover. Then, in order of highest % cover, add in species until you exceed 50% and then add in any that are at least 20%. If there are ties, you must add them all.

Example B: Quick Method

You do this quick method on your raw % cover data. Simply multiply your Total Stratum Cover (in this plot it’s 75%) by 50% to come up with your first threshold, then by 20% to come up with your second threshold. In the example below, 50% of 75 is **37.5%** and 20% of 75 is **15%**. Use these instead of 50% and 20%. Your most “abundant” species is *Carex obnupta* at 25% cover. As that does not exceed 37.5% you must include the next most abundant species (the *Geum* and the *Poa*, which are tied at 15%). That takes you to 55%, now exceeding 37.5%. No additional species are brought in as no other species are at least 15% cover. Your result is the same as in Example A.

Plant Species: Herb Stratum	Raw % Cover
<i>Carex obnupta</i> *	25*
<i>Geum macrophyllum</i> *	15*
<i>Poa trivialis</i> *	15*
<i>Carex unilateralis</i>	10
<i>Potentilla gracilis</i>	5
<i>Agrostis tenuis</i>	5
Stratum Cover:	75
Bare ground	25
* = Dominant	

Example C: Using BPJ when selecting dominants

Plant Species: Herb Stratum	Raw % Cover	Relative % Cover
<i>Carex unilateralis</i> *	35	23*
<i>Juncus tenuis</i>	15	10*
<i>Deschampsia cespitosa</i> *	40	27*
<i>Hordeum brachyantherum</i>	15	10*
<i>Mentha pulegium</i> *	20	13*
<i>Agrostis tenuis</i>	15	10*
Unid. fuzzy yellow composite	10	07
Stratum Cover:	150	100
* = Dominant		

Explanation for Example B: The 50/20 rule requires adding species in descending order of abundance until you exceed 50%. $27 + 23 = 50$, so you must include the next most abundant species, the *Mentha pulegium*. However, in this example the investigator used BPJ to include the three 10% cover species as well, because it's unlikely that the visual estimate of 15% cover as opposed to 20% cover is accurate and meaningful. (The composite wasn't included because it could not be identified to species.) When you make BPJ adjustments, explain your reasoning on the data sheet.

Example D: Selection of dominant plants in a Plot with 2 strata, using the Full 50/20 Method and applying the hydrophytic vegetation “Basic Rule” indicator

This example shows the Full Method. Each stratum is handled separately until Step 2. Step 1 is to determine the dominant species in each stratum, as described in Example A and as shown in the table below.

Plant Species: Shrub Stratum	Status	Raw % Cover	Relative % Cover
<i>Crataegus douglasii</i>	FAC	15	33*
<i>Crataegus monogyna</i>	FACU+	25	56*
<i>Fraxinus latifolia</i>	FACW	5	11
Stratum Cover:		45	100
* = Dominant			

Plant Species: Herb Stratum	Status	Raw % Cover	Relative % Cover
<i>Danthonia californica</i>	FACU	10	12
<i>Deschampsia cespitosa</i>	FACW	30	35*
<i>Poa trivialis</i>	FACW	10	12
<i>Carex unilateralis</i>	FACW	15	18*
<i>Juncus tenuis</i>	FACW-	T	
<i>Agrostis tenuis (capillaris)</i>	FAC	5	5
<i>Parentucellia viscosa</i>	FAC-	15	18*
Stratum Cover:		85	100
* = Dominant			

After dividing each species by the raw stratum cover to obtain relative % cover and applying the 50/20 rule, you have now starred your dominant species, above. Use those dominant species in Step 2.

Step 2: Percent of dominant species that are OBL, FACW, or FAC (not FAC-): 3/5 or 60%
 Hydrophytic Vegetation Indicator Met: Yes No

Example E: Selection of dominant plants in a 2 strata plot using the Quick 50/20 Method and applying the hydrophytic vegetation “Basic Rule” indicator

Plant Species: Shrub Stratum	Status	Raw % Cover
<i>Crataegus douglasii</i>	FAC	15*
<i>Crataegus monogyna</i>	FACU+	25*
<i>Fraxinus latifolia</i>	FACW	5
Stratum Cover:		45
* = Dominant		

Shrub Stratum Threshold Calculations: 50% of 45 = **22.50**; 20% of 45 = **9%**
C. monogyna cover is 25% which exceeds the 50% threshold of 22.50. Are there any additional species that are at least 20% of the total cover? Yes, *C. douglasii* cover is 15%, so it must also be included.

Plant Species: Herb Stratum	Status	Raw % Cover
<i>Danthonia californica</i>	FACU	10
<i>Deschampsia cespitosa</i>	FACW	30*
<i>Poa trivialis</i>	FACW	10
<i>Carex unilateralis</i>	FACW	15*
<i>Juncus tenuis</i>	FACW-	T
<i>Agrostis tenuis (capillaris)</i>	FAC	5
<i>Parentucellia viscosa</i>	FAC-	15*
Stratum Cover:		85
* = Dominant		

Herb Stratum Threshold Calculations: 50% of 85 = **42.50%**; 20% of 85 = **17%**
Deschampsia cover is 30% which does not exceed 42.50% so we add in the next most abundant species, which are *Carex Unilateralis* and *Parentucellia viscosa* (tied at 15% cover). That takes us to 60% which does exceed 42.50. Are there any additional species that are at least 17% raw cover? No.

Step 2: Percent of dominant species that are OBL, FACW, or FAC (not FAC-): 3/5 or 60%
 Hydrophytic Vegetation Indicator Met: Yes No

The quick method result is the same as the result in Example D.

Example F: DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: _____ City: _____ Date: _____ File # _____
 Project/Contact: _____ Det. by: _____
 Plant Community: _____ Plot # _____
 Plot location: _____
 Recent Weather: _____
 Do normal environ. conditions exist? Y ___ N ___ If No, explain: _____
 Has Vegetation ___ Soil ___ Hydrology ___ been significantly disturbed?
 Explain: _____

VEGETATION

Tree Stratum			Herb Stratum		
	Status / Raw % Cover / Rel. % Cover			Status / Raw % Cover / Rel. % Cover	
1. _____			1. <i>Danthonia californica</i>	FACU	10 12
2. _____			2. <i>Deschampsia cespitosa</i>	FACW	30 35 *
3. _____			4. <i>Poa trivialis</i>	FACW	10 12
			5. <i>Carex unilateralis</i>	FACW	15 18 *
Sapling/Shrub Stratum			6. <i>Juncus tenuis</i>	FACW-	1
1. <i>Crataegus douglasii</i>	FAC	15 33 *	7. <i>Aristida tenax</i>	FAC	5 5
2. <i>Crataegus monogyna</i>	FACU+	25 56 *	8. <i>Potentilla viscosa</i>	FAC-	15 18 *
3. <i>Fraxinus latifolia</i>	FACW	5 11	9. _____		
4. _____			10. _____		
5. _____			11. _____		

Hydrophytic Vegetation Indicators:

> 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 3/5 or 60%

Visual observation of species growing in areas of prolonged inundation/saturation*
 Morphological Adaptations* Physiological or reproductive adaptations*

Criteria Met? YES NO Comments: _____

SOILS

Map Unit Name: _____ Drainage Class: _____

On Hydric Soils List? Y ___ N ___ Has hydric inclusions? Y ___ N ___

Depth Range of Horizon	Matrix Color	Redox Concentrations * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
------------------------	--------------	--	-------------------	---------

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions/Nodules (w/in 3"; > 2mm)
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High organic content in surface (in Sandy Soils)
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic streaking (in Sandy Soils)
<input type="checkbox"/> Reducing Conditions (tests positive)	<input type="checkbox"/> Organic pan (in Sandy Soils)
<input type="checkbox"/> Gleyed or low chroma colors	<input type="checkbox"/> Listed on Hydric Soils List (and soil profile matches)
<input type="checkbox"/> Redox features within 10 inches (e.g., concentrations)	<input type="checkbox"/> Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
	<input type="checkbox"/> Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES ___ NO ___

HYDROLOGY

Recorded Data
 Recorded Data Available Aerial Photos Stream gauge Other No Recorded Data Available

Field Data
 Depth of inundation: _____ Depth to Saturation: _____ Depth to free water: _____

Primary Hydrology Indicators:

Inundated
 Saturated in upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

Oxidized Root Channels (upper 12")
 Water-stained Leaves
 Local Soil Survey Data
 FAC-Neutral Test
 Other: _____

Criteria Met? YES ___ NO ___ Comments: _____

DETERMINATION

WETLAND? YES ___ NO ___ Comments: _____

Example G: DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Quick Method

County: _____ City: _____ Date: _____ File # _____
 Project/Contact: _____ Det. by: _____
 Plant Community: _____ Plot # _____
 Plot location: _____
 Recent Weather: _____
 Do normal environ. conditions exist? Y ___ N ___ If No, explain: _____
 Has Vegetation ___ Soil ___ Hydrology ___ been significantly disturbed?
 Explain: _____

VEGETATION

Tree Stratum
 Total Plot Cover: _____ 50% _____ 20% _____
 Status / Raw % Cover

1. _____
2. _____
3. _____

Sapling/Shrub Stratum
 Total Plot Cover: 45 50% 22.50 20% 9
 Status/Raw % Cover

1. Crataegus douglasii FAC 15 *
2. Crataegus monodyna FACU+ 25 *
3. Fraxinus latifolia FACW 5
4. _____

Herb Stratum
 Total Plot Cover: 85 50% 42.50 20% 17
 Status / Raw % Cover

1. Danthonia californica FACU 10
2. Deschampsia cespitosa FACW 30 *
4. Poa trivialis FACW 10
5. Carex unilateralis FACW 15 *
6. Juncus tenuis FACW 1
7. Agrostis tenuis FAC 5
8. Patentocella viscosa FAC- 15 *
9. _____
10. _____
11. _____
12. _____

Hydrophytic Vegetation Indicators:

> 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): 3/5 or 60%

___ Visual observation of species growing in areas of prolonged inundation/saturation*
 ___ Morphological Adaptations* ___ Physiological or reproductive adaptations*

Criteria Met? YES NO _____ Comments: _____

SOILS

Map Unit Name: _____ Drainage Class: _____

On Hydric Soils List? Y _____ N _____ Has hydric inclusions? Y _____ N _____

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions*	Texture
------------------------	--------------	---	-------------------	---------

Hydric Soil Indicators:

- | | |
|---|--|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Concretions/Nodules (w/in 3"; > 2mm) |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High organic content in surface (in Sandy Soils) |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic streaking (in Sandy Soils) |
| <input type="checkbox"/> Reducing Conditions (tests positive) | <input type="checkbox"/> Organic pan (in Sandy Soils) |
| <input type="checkbox"/> Gleyed or low chroma colors | <input type="checkbox"/> Listed on Hydric Soils List (and soil profile matches) |
| <input type="checkbox"/> Redox features within 10" (e.g., concentrations) | <input type="checkbox"/> Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration) |
| | <input type="checkbox"/> Supplemental indicator (e.g., NRCS field indicator): _____ |

Criteria Met? YES _____ NO _____

HYDROLOGY

Recorded Data

___ Recorded Data Available ___ Aerial Photos ___ Stream gauge ___ Other ___ No Recorded Data Available

Field Data

Depth of inundation: _____ Depth to Saturation: _____ Depth to free water: _____

Primary Hydrology Indicators:

- Inundated
- Saturated in upper 12 inches
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns

Secondary Hydrology Indicators (2 or more required):

- Oxidized Root Channels (upper 12")
- Water-stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other: _____

Criteria Met? YES _____ NO _____ Comments: _____

DETERMINATION

WETLAND? YES _____ NO _____ Comments: _____

* Explain in Comments; attach additional information as needed

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Full Method

County: _____ City: _____ Date: _____ File # _____
Project/Contact: _____ Det. by: _____
Plant Community: _____ Plot # _____
Plot location: _____
Recent Weather: _____
Do normal environ. conditions exist? Y ___ N ___ If No, explain: _____
Has Vegetation ___ Soil ___ Hydrology ___ been significantly disturbed?
Explain: _____

VEGETATION

Table with 4 columns: Tree Stratum, Status / Raw % Cover / Rel. % Cover, Herb Stratum, Status / Raw % Cover / Rel. % Cover. Rows 1-11 for each stratum.

Percent of Dominant Species that are OBL, FACW, FAC (not FAC-): _____
Other Hydrophytic Vegetation Indicators: _____

Criteria Met? YES _____ NO _____ Comments: _____

SOILS

Map Unit Name: _____ Drainage Class: _____

On Hydric Soils List? Y _____ N _____ Has hydric inclusions? Y _____ N _____

Table with 5 columns: Depth Range of Horizon, Matrix Color, Redox Concentrations*, Redox Depletions*, Texture. Includes a footnote: * abund./size/contrast/color/location (matrix or pores/peds)

- Hydric Soil Indicators:
___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Reducing Conditions (tests positive)
___ Gleyed or low chroma colors
___ Redox features within 10 inches (e.g., concentrations)
___ Concretions/Nodules (w/in 3"; > 2mm)
___ High organic content in surface (in Sandy Soils)
___ Organic streaking (in Sandy Soils)
___ Organic pan (in Sandy Soils)
___ Listed on Hydric Soils List (and soil profile matches)
___ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
___ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES _____ NO _____

HYDROLOGY

Recorded Data
___ Recorded Data Available ___ Aerial Photos ___ Stream gauge ___ Other ___ No Recorded Data Available

Field Data
Depth of inundation: _____ Depth to Saturation: _____ Depth to free water: _____

- Primary Hydrology Indicators:
___ Inundated
___ Saturated in upper 12 inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns
Secondary Hydrology Indicators (2 or more required):
___ Oxidized Root Channels (upper 12")
___ Water-stained Leaves
___ Local Soil Survey Data
___ FAC-Neutral Test
___ Other: _____

Criteria Met? YES _____ NO _____ Comments: _____

DETERMINATION

WETLAND? YES _____ NO _____ Comments: _____

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM—Quick Method

County: _____ City: _____ Date: _____ File # _____
 Project/Contact: _____ Det. by: _____
 Plant Community: _____ Plot # _____
 Plot location: _____
 Recent Weather: _____
 Do normal environ. conditions exist? Y ___ N ___ If No, explain: _____
 Has Vegetation ___ Soil ___ Hydrology ___ been significantly disturbed?
 Explain: _____

VEGETATION

<u>Tree Stratum</u>			<u>Herb Stratum</u>		
Total Plot Cover: _____	50% _____	20% _____	Total Plot Cover: _____	50% _____	20% _____
		Status / Raw % Cover			Status / Raw % Cover
1. _____			1. _____		
2. _____			2. _____		
3. _____			4. _____		
			5. _____		
			6. _____		
			7. _____		
			8. _____		
			9. _____		
			10. _____		
			11. _____		
			12. _____		

Hydrophytic Vegetation Indicators:
 _____ > 50% of dominants are OBL, FACW or FAC Percent of Dominant **Species** that are OBL, FACW, FAC (not FAC-): _____
 * Other hydrophytic vegetation indicators: _____

Criteria Met? YES _____ NO _____ Comments: _____

SOILS

Map Unit Name: _____ Drainage Class: _____
 On Hydric Soils List? Y _____ N _____ Has hydric inclusions? Y _____ N _____

Depth Range of Horizon	Matrix Color	Redox Concentrations* * abund./size/contrast/color/location (matrix or pores/peds)	Redox Depletions* * abund./size/contrast/color/location (matrix or pores/peds)	Texture
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Hydric Soil Indicators:

_____ Histosol	_____ Concretions/Nodules (w/in 3"; > 2mm)
_____ Histic Epipedon	_____ High organic content in surface (in Sandy Soils)
_____ Sulfidic Odor	_____ Organic streaking (in Sandy Soils)
_____ Reducing Conditions (tests positive)	_____ Organic pan (in Sandy Soils)
_____ Gleyed or low chroma colors	_____ Listed on Hydric Soils List (and soil profile matches)
_____ Redox features within 10" (e.g., concentrations)	_____ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
	_____ Supplemental indicator (e.g., NRCS field indicator): _____

Criteria Met? YES _____ NO _____

HYDROLOGY

Recorded Data
 _____ Recorded Data Available _____ Aerial Photos _____ Stream gauge _____ Other _____ No Recorded Data Available

Field Data
 Depth of inundation: _____ Depth to Saturation: _____ Depth to free water: _____

Primary Hydrology Indicators:	Secondary Hydrology Indicators (2 or more required):
_____ Inundated	_____ Oxidized Root Channels (upper 12")
_____ Saturated in upper 12 inches	_____ Water-stained Leaves
_____ Water Marks	_____ Local Soil Survey Data
_____ Drift Lines	_____ FAC-Neutral Test
_____ Sediment Deposits	_____ Other: _____
_____ Drainage Patterns	

Criteria Met? YES _____ NO _____ Comments: _____

DETERMINATION

WETLAND? YES _____ NO _____ Comments: _____

* Explain in Comments; attach additional information as needed

Example of Good Explanation for Use of "Other" Hydrophytic Vegetation Indicators

DATA FORM ROUTINE WETLAND DETERMINATION (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Isabelle St.</u>	Date: <u>15 May 1996</u>
Applicant/Owner: <u>City of Eugene / BLMA</u>	County: <u>LANE</u>
Investigator: <u>DB / BN / PL</u>	State: <u>OR</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	Transect ID: <u>A</u>
Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No	Plot ID: <u>Z</u>
(If needed, explain on reverse.)	

T-45%
S-5

50' S. OF A-1

VEGETATION H-90 (10% standing water)

Dominant Plant Species	Stratum	Indicator	Non-Dominant Plant Species	Stratum	Indicator
1. <u>Anthoxanthum odoratum</u>	<u>H-60</u>	<u>FACW</u>	9. <u>Rosa multiflora</u>	<u>S</u>	<u>(est. FAC+)</u> <u>NONE</u>
2. <u>Deschampsia cespitosa</u>	<u>H-20</u>	<u>FACW</u>	10. <u>Rubus discolor</u>	<u>S</u>	<u>FACW</u>
3. <u>Danthonia californica</u>	<u>H-20</u>	<u>FACW</u>	11. <u>Crataegus siskiytoii</u>	<u>S</u>	<u>FAC</u>
4. _____	_____	_____	12. " "	<u>T</u>	<u>FAC</u>
5. _____	_____	_____	13. <u>Fraxinus latifolia</u>	<u>T</u>	<u>FACW</u>
6. _____	_____	_____	14. <u>Vicia sativa</u>	<u>H</u>	<u>UPL</u>
7. _____	_____	_____	15. <u>Juncus tenuis</u>	<u>H</u>	<u>FACW-</u>
8. _____	_____	_____	16. <u>Lotus purshianus</u> var. ^{pursh.} _____	<u>H</u>	<u>UPL</u>
			<u>Aster thalictroides</u>	<u>H</u>	<u>(est. FAC+)</u>

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 33%

Remarks: Lotus formosissimus, Vicia hirsuta, Sisyrinchium idahoense, Parentucella viscosa, Plantago lanceolata, Parnellia vulgaris var. lanceolata, Bradiaea sp., Myosotis discolor, unid. moss
 Other non-doms: Many spp. (ANTODO) on this list grow in uplands more frequently than wetlands, but grow equally well in

both. ANTODO is a spp. we have seen growing often and growing well in jurisdictional wetlands. Because wetland hydrology and soil indicators are strong, HYDROLOGY vegetation is being considered hydrophytic at this sample point.

<p>Recorded Data (Describe in Remarks):</p> <p>___ Stream, Lake, or Tide Gauge</p> <p>___ Aerial Photographs</p> <p>___ Other</p> <p><input checked="" type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><u>0" few</u> <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p>___ Water-Stained Leaves</p> <p>___ Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>0-3"</u> (in.)</p> <p>Depth to Free Water in Pit: <u>3"</u> (in.)</p> <p>Depth to Saturated Soil: <u>sat. to surface</u> (in.)</p>	<p>Remarks: <u>H2O flowing in @ ~4". Heavy rain today.</u></p>

Appendix I: Example of Seed Mix Information

IRWIN & SONS AG SUPPLY

22537 HWY 36 , CHESHIRE, OR 97419

%PURE SEED	KIND	ORIGIN	%GERM
38.89	POTOMAC ORCHARDGRASS	OR	91.5
34.67	ARIKI PERENNIAL RYEGRASS	OR	90.75
14.96	NZ WHITE CLOVER	OR	88.11:99
9.94	JAMA ANNUAL TETRAPLOID	OR	90.
0.41	OTHER CROP		
1.06	INERT MATTER		
0.07	WEED		

LOT # PNW6-01-9-21

AMS 710

TEST DATE 9/01

NET WEIGHT: 50 LBS

PNW6-IRRIGATED PASTURE MIX

IRWIN & SONS WARRANTS TO THE EXTENT OF THE PURCHASE PRICE THAT SEEDS SOLD ARE AS DESCRIBED ON THE CONTAINER WITHIN RECOGNIZED TOLERANCES. SELLER GIVES NO OTHER OR FURTHER WARRANTY EXPRESSED OR IMPLIED.

Appendix J: Examples of Informative Data Forms

The first example provides helpful information in the comments section about the area characterized by the data plot and the limits of the jurisdictional boundaries. The second example shows a good method for presenting multiple hydrology checks/dates on one data form. Normally, a data form will contain data from only one date.

WETLAND DETERMINATION DATA FORM

City: 2 miles northwest of Cobure County: Lane Date: 11/10/01 File #: 01-0303
 Project/Contact: cess road Investigator:
 Plant Community: Bare / Inundated Plot #: 1-2 AK (Access road)
 Plot location: Bottom of Dry Muddy Creek, 15' S of N Pline (NO of road/culvert crossing)
 Recent weather: showers 6 days prior to field visit, last significant rainfall 10/27-31, day of field visit clear, cool temp.
 Do normal environ. conditions exist? Yes No Explain: Rainfall year-to-date at 42% normal, November rainfall month-to-date at 6% of normal
 Vegetation Soil Hydrology been significantly disturbed? Explain

VEGETATION

Dominant Plant Species*	Stratum	% Cover	Status	Dominant Plant Species	Stratum	% Cover	Status
1. <u>Bare</u>		<u>100</u>		6.			
2.				7.			
3.				8.			
4.				9.			
5.				10.			

*Dominant species comprise over 20% absolute cover in plot Tree total cover: 0 Sapling/shrub total cover: 0 Herb total cover: 0
 Percent of Dominant species (d) that are OBL, FACW, FAC+, and FAC (not FAC-):
 Criteria Met? 3 Remarks: Can't be used due to lack of vegetation: it is inundated

SOILS

Map Unit Name: #33 Conser Silty Clay Loam Drainage Class: Poorly drained
 Taxonomy: mesic typic argiaquall On Hydric Soil List? Yes
 Confirmed Mapped Soil Type?

Depth	Matrix Color	Redox Concentrations*	Redox Depletions*	Texture/Structure
<u>0-6"</u>	<u>10YR3/2</u>			<u>SIL, sticky, saturated</u>
<u>6-18"</u>	<u>2.5Y 3/1</u>			<u>mucky CL</u>

*abundance/size/contrast/color/location (matrix or pores/peds)

Hydric Soil Indicators:

 Histosol Gleyed Organic Streaking (Sandy soils)
 Histic Epipedon Redox features w/in top 10" Organic Pan (Sandy soils)
X Sulfidic Odor Concretions/Modules Listed on Hydric soils list (& soil profile matches)
 Reducing Conditions High Org. Content in Sandy soils X Others: chroma of 1

Criteria Met? yes Remarks:

HYDROLOGY

X Recorded Data Available: X Aerial Photos Stream Gauge Other
 No Recorded Data Available

Field Data: Depth of inundation: 6" Depth to saturation: 0" Depth to free water: 0"
 Primary Hydrology Indicators: Secondary Hydrology Indicators (2 or more required):
X Inundated X Oxidized Root Channels in upper 12"
 Saturated in upper 12" Water-stained Leaves
 Water marks Local Soil Survey Data
 Drift Lines Fac-Neutral Test
 Sediment Deposits Other
X Drainage Patterns

Criteria Met? yes Remarks: Inundation to culvert, saturated S. of culvert

Determination: Wetland? Yes (low) No Comments: this plot is from road crossing N to fence line - along bottom of "creek" (ditch) - Bottom is approx 3' wide, TOB is approx 14' wide, vegetation is growing down bank to approx. 2' above bottom of bank (OHW line). No vegetation in bottom of channel.

WETLAND DETERMINATION DATA FORM

City: _____ County: Lane Date: 2/24, 3/10/03 Investigator: _____
 Project Location: _____ Contact: _____
 Plant Community: Annual ryegrass field Plot #: 2-14
 Plot Location: 240' W of 2-13, 35' W of 2-15

Normal Environmental Conditions? Yes
 Vegetation Soil Hydrology significantly disturbed? Yes, plowed, ditched, planted to annual ryegrass
 Recent weather:

2/24-25/03-Rained 6 of past 14 days, last rain 2/20, Precip MTD 41% normal (2.45", normal 5.93"), YTD 67% of normal
 3/3/03- Rained 6 of past 14 days, raining on day of visit, Precip MTD 43% normal (0.12", normal 0.18"), YTD 67% of normal
 3/10/03- Rained 9 of past 14 days, last rain 3/9, Precip MTD 120% normal (2.47", normal 2.06"), YTD 74% of normal

VEGETATION

Dominant plant species	Stratum	%cover	Status	Dominant plant species	Stratum	%cover	Status
1. <i>Lolium multiflorum</i>	H	50	UPL	2. <i>Bare</i>		50	

Percent of dominant species that are OBL, FACW, FAC+, and FAC: 0/1 = 0%
 Criteria met? No. Remarks: entire site is ryegrass field, so vegetation not considered when making determination

SOILS

Map Unit Name: #5: Awbrig silty clay loam Drainage class: Poorly drained
 Taxonomy: mesic vertic albaqualf Hydric Soil List? Yes

Confirmed mapped soil type?

Depth	Matrix color	Redox concentrations*	Redox depletions	Texture/structure
0-13"	10YR3/1			SCL, wet granular
13-16"	10YR3/1			CL, wet, blockier

*abundance/size/contrast/color/location (matrix or pores/peds)
 Histosol Gleyed Organic streaking (sandy soils)
 Histic epipedon Redox features w/in top 10" Organic pan (sandy soils)
 Sulfidic odor Concretions/Nodules Listed on Hydric Soil List
 Reducing conditions High org. content in sandy soils Others: chroma of 1

Criteria Met? Remarks: _____

HYDROLOGY

Recorded data available: Aerial photos Stream gauge Other
 No recorded data available

Field observations: Date: 2/24/03
 Depth of surface water: 0" Depth to free water in pit: 9" Depth to saturated soil: 4"
 inundated saturated in upper 12"

Criteria Met? Remarks: _____

Field observations: Date: 3/10/03
 Depth of surface water: 0" Depth to free water in pit: 6" Depth to saturated soil: 0"
 inundated saturated in upper 12"

Criteria Met? Remarks: _____

Field observations: Date: _____
 Depth of surface water: _____ Depth to free water in pit: _____ Depth to saturated soil: _____
 inundated saturated in upper 12"

Criteria Met? _____ Remarks: _____

Determination: W Wetland

Comments: Paired to 2-15 to define v/w boundary

Appendix K:

Crib Sheet for Describing Redoximorphic Features

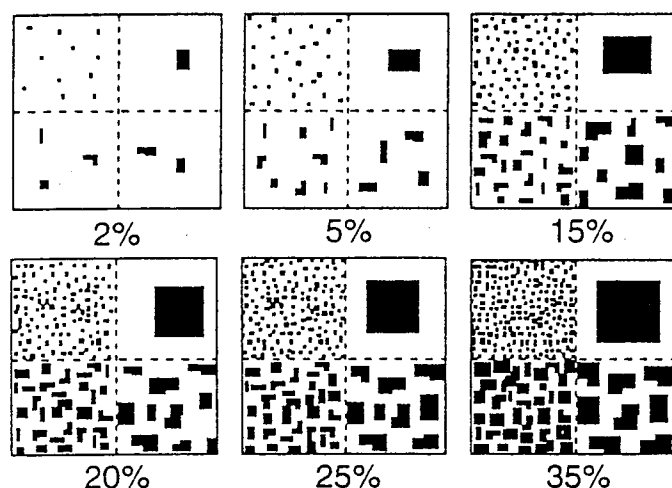
Source: Field book for describing and sampling soils. NRCS. 1998.

1) QUANTITY

REDOXIMORPHIC FEATURES - QUANTITY (Percent of Area Covered) -

Class	Code		Criteria: Percent of Surface Area Covered
	Conv.	NASIS	
Few	f	#	< 2
Common	c	#	2 to < 20
Many	m	#	≥ 20

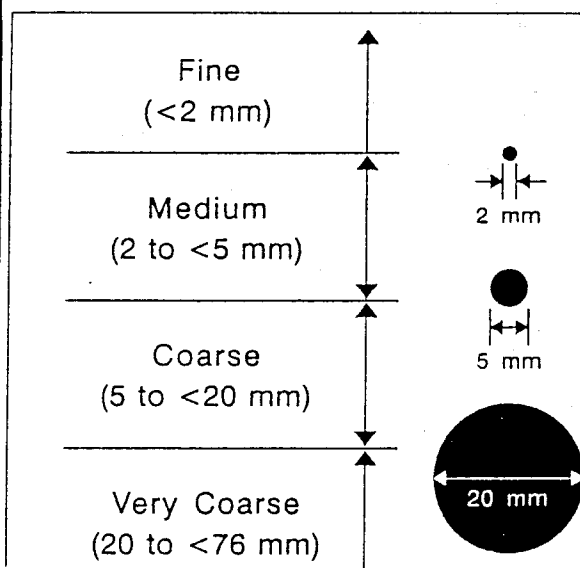
NOTE: Within any given box, each quadrant contains the same total area covered, just different sized objects.



2) SIZE

REDOXIMORPHIC FEATURES - SIZE

Size Class	Code	Criteria
Fine	1	< 2 mm
Medium	2	2 to < 5 mm
Coarse	3	5 to < 20 mm
Very Coarse	4	20 to < 76 mm
Extremely Coarse	5	≥ 76 mm



3) CONTRAST

Contrast—the relative difference between the mottle color and the matrix color. Classes of contrast are:

Faint—mottles evident only on close scrutiny. Mottle color and matrix color are very nearly the same.

Distinct—mottles are readily seen though not striking. Mottle color and matrix color are different, though not widely so.

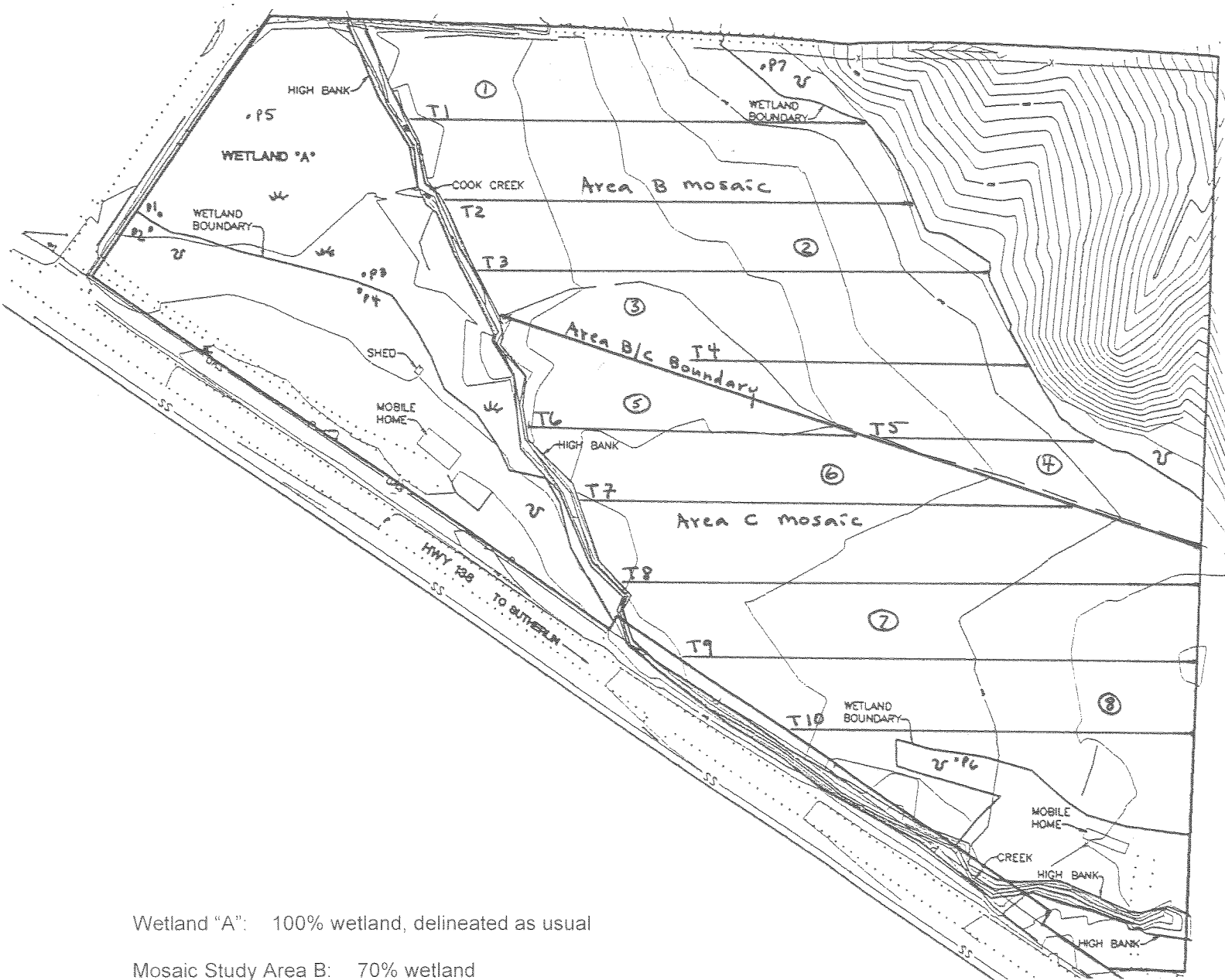
Prominent—mottles are so conspicuous that they are the outstanding visible feature of the horizon. Mottle color and matrix color are widely different.

Color—mottle colors are described in the same way as colors of any horizon. The most common mottle colors are yellowish-brown, dark reddish-brown, and gray.

Contrast - Record the color difference between the mottle and the dominant matrix color. Use this table or the following chart to express the difference.

Contrast Class	Code	Difference in Color Between Matrix and Mottle		
		Hue ¹	Value	Chroma
Faint ²	F	same page	0 to ≤ 2	and ≤ 1
Distinct	D	same page	> 2 to < 4	and < 4
		1 page	< 4	and > 1 to < 4
Prominent	P	1 page	≤ 2	and ≤ 1
		same page	≥ 4	or ≥ 4
		≥ 2 pages	> 2	or > 1
		≥ 2 pages	≥ 0	or ≥ 0

Appendix L: Example of Wetland/Upland Mosaic Delineation



Wetland "A": 100% wetland, delineated as usual

Mosaic Study Area B: 70% wetland
 Samples 1 - 4 characterize Area B wetland & upland plant communities (2 per community)
 Percent wetland derived from point intercept along transects T1 through T5

Mosaic Study Area C: 40% wetland
 Samples 5 - 8 characterize Area C wetland & upland plant communities (2 per community)
 Percent wetland derived from point intercept along transects T6 through T10

Note: The mosaic/upland boundary is interpolated between the outermost wetland edges as shown below. A similar approach would be needed for a mosaic/wetland boundary (in the example above, the creek forms the mosaic/wetland boundary).

