

FINAL

WETLAND MAPPING CONVENTIONS - TENNESSEE
AUGUST 2, 1994

INTRODUCTION

The information contained in this document is provided to assist SCS field offices in Tennessee to complete wetland determinations utilizing standardized procedures and off site techniques acceptable to the Soil Conservation Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the Environmental Protection Agency as agreed under the Memorandum of Agreement between these signatory agencies on January 6, 1994. Off site wetland determinations utilizing these conventions will not reflect wetland delineations, although approximate wetland boundaries will be indicated on a map. An official wetland delineation requires flagging the wetland boundary on the ground.

It is intended that the contained wetland mapping conventions provide sufficient information to enable off site wetland determinations adequate to meet the requirements of both the Clean Water Act (CWA) and the Food, Agriculture, Conservation and Trade Act of 1990 (FACTA) on "agricultural" lands. These mapping conventions may or may not provide sufficient information to allow valid off site wetland determinations for "non-agricultural" lands. These same mapping convention tools should be utilized with additional local information, and if the information is inadequate, on site procedures will be required to make the wetland determination. All identified wetlands provided to landusers will have a transmittal letter clarifying that on site determinations and delineations will be required for both the CWA and FACTA before any drainage activity, conversion, non-agricultural use, or other manipulation is performed.

Off site wetland determinations are permissible for FACTA on agricultural lands under the National Food Security Act Manual, 3rd Edition, provided adequate remote sensing imagery is available. Multiple years of adequate imagery on agricultural lands could provide a more accurate assessment of wetland criteria than an on site wetland determination. Agricultural lands lend themselves to remote sensing techniques primarily because hydro periods remain relatively unobstructed to remote sensing equipment. Off site determinations are also permissible for the CWA under the 1987 Corps of Engineers Wetlands Delineation Manual, if sufficient information is available.

Agricultural lands are defined as those lands intensively used and managed for the production of food or fiber to the extent that the natural vegetation has been removed and cannot be used to determine whether the area meets applicable hydrophytic vegetation criteria in making a wetland determination. These lands include cropland, hayland, pasture land, orchards,

vineyards, and areas which support wetland crops (e.g., rice). Non-agricultural lands are defined as those lands where natural vegetation has not been removed even though that vegetation may be regularly grazed or mowed and collected as forage or fodder. Non-agricultural lands include forest lands, wood lots and tree farms, and may include areas supporting a prevalence (>50 percent) of naturally occurring vegetation. Note: Remote sensing of native herbaceous plant communities will be difficult to ascertain.

Areas recently used for the production of food or fiber and those that do not meet abandonment criteria are considered agricultural lands, notwithstanding the fact that natural vegetation may occur on such lands. Areas that are abandoned and not used for agricultural purposes are non-agricultural lands despite the fact they were cropped in the past. Abandonment for purposes of these conventions will be defined by the NFSAM, 3rd Edition. The enrollment of the area in a USDA set aside program or similar program of conservation use is considered to be the same as cropped, and the area is not abandoned despite the fact that crop production may not have occurred for a five-year period. However, these set aside areas will be considered non-agricultural lands if a prevalence of native vegetation or permanent water is present and discernible when using the off site procedures.

The mapping conventions described in this document conform to wetland definitions as stated in the National Food Security Act Manual (NFSAM), 3rd Edition, and to the methodology for developing a wetland inventory or completing off site wetland determinations as defined in this Manual. Five conventions will adequately address those "jurisdictional" wetlands in Tennessee the signatory agencies require inventoried:

- (1) Prior Converted Croplands
- (2) Farmed Wetlands (including Farmed Wetland Pastures)
- (3) Converted Wetlands
- (4) Artificial Wetlands (1.0 acre or larger)
- (5) Wetlands

Deepwater habitats such as lakes and ponds are included in the Artificial Wetland and Wetland mapping conventions. However, other "Waters of the United States" such as perennial and intermittent streams are not included in this set of conventions. U.S. Geological Survey (USGS) quadrangle maps and the U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps adequately inventory streams. The landowner will be informed by letter when the determination is provided whether "other waters" such as streams (as indicated on USGS or NWI maps) occur on the tract, and that these waters may be jurisdictional. Streams will not be identified by SCS on the aerial photograph.

Other wetland "types" as described in the NFSAM, such as mitigation wetlands, minimal effect wetlands, wetlands converted for non-agricultural purposes, manipulated wetlands, etc., will not be considered in these conventions. These NFSAM wetland types represent program exemptions, will be difficult to identify by remote sensing, and will require an on site visit. The intent of these conventions is to identify wetlands by off site remote sensing techniques using the basic parameters of hydric soils, hydrology, and the existence or capability of supporting hydrophytic plants.

This mapping convention will not result in delineated wetlands. Lines drawn on a map are recognized as general locations of the wetland boundary as it may exist on the ground. This is due to map scales and unavoidable human error in transferring lines from remote sensing imagery. Wetlands are not "delineated" until actual boundaries are identified and flagged on the ground.

The tools available to make off site determinations will vary between counties. At the county level, the best and most complete data must be used to make individual wetland determinations. This data may consist of soil surveys, Agricultural Stabilization and Conservation Service (ASCS) aerial photographs, ASCS compliance slides, satellite imagery, U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps, USGS quadrangle maps and surveys, flood data and maps, weather records, prior SCS wetland inventories, and knowledge of individuals. The basic tools available to all counties in the state include ASCS aerial photographs, NWI maps, USGS quadrangle maps, weather data, and soil surveys. ASCS crop compliance slides are available in most counties. Satellite imagery will be purchased for West Tennessee, subject to funding constraints. An SCS wetland inventory was completed in 1990 and is available in 56 counties of the state. The State Wetland Oversight team will make an assessment of quality and selection of appropriate available tools for each county. The team will work with county staffs to identify all adequate and inadequate tools.

Limitations of these tools must be considered when utilized for making wetland determinations. NWI maps do not inventory wetlands on agricultural lands. NWI maps may also identify bottomland hardwoods as wetlands when hydric soils and sufficient hydrology is lacking. The prior SCS wetland inventory on non-agricultural lands is only as accurate as the soil survey. Several soil surveys are outdated and were not developed with an emphasis for delineating hydric soils. Soil survey map units may contain unmapped inclusions and may not have mapped units smaller than three (3) acres. ASCS compliance slides are often summer flights that may not provide adequate imagery of flooding or ponding hydro periods. For these reasons, combinations of tools must be used. If adequate tools are unavailable or off site procedures do not yield consistently correct determinations

(acceptable level of accuracy will be 90 percent with no more than a 5 percent margin of error), on site procedures must be used. NOTE: On site determinations will include an analysis of available information as described in the appropriate off site procedure, plus an on site visit and investigation. Sufficient data must be obtained to enable the wetlands delineator to document that the area in question is properly identified.

The strengths of these tools are also noted. Assuming the proper antecedent moisture and rainfall conditions are captured in the satellite imagery purchased, this imagery should provide accurate and defensible flooding and ponding hydrology on agricultural lands. In addition, this imagery may also provide accurate flooding and ponding hydrology on non-agricultural lands for hardwood sites prior to spring leaf out. The prior SCS wetland inventory should provide accurate Converted Wetland determinations between the years 1986 and 1990 for those areas occurring on mapped hydric soils. NWI maps should be accurate for all artificial wetlands created prior to the year the data was collected. NWI maps should also be inclusive of actual non-agricultural wetlands although some non-wetlands may be identified as wetlands.

The State Wetland Oversight team will have the following responsibilities pertaining to these mapping conventions:

1. Conduct adequate field testing of off site procedures and tools to assure that correct determinations are made. Field testing will include non-wetland determinations on both agricultural and non-agricultural bottomland areas.
2. Reconcile differences between on site wetland determinations and mapping conventions. This will be done in each county when the field testing during quality reviews indicates significant error between off site and on site determinations and may require elimination of tools or changes in methodology.
3. Make appropriate modifications or revisions to the conventions to correct major deficiencies or address problem areas. All modifications or revisions will be subject to approval by all signatory agencies.
4. Identify special problem areas in the state and the procedures for making wetland determinations in those areas.
5. Establish priority data needs for modifying or revising these mapping conventions where appropriate.

These mapping conventions must be reviewed and approved by the SCS South National Technical Center in Fort Worth, Texas, and all signatory agencies of the current wetlands Memorandum of Agreement signed January 6, 1994. Coordination with surrounding states will also be conducted to ensure that consistency of wetland inventories and/or determinations occur across state lines. Such coordination may include providing copies of determinations for those tracts adjacent to state lines, coordination of field visits with adjoining states during quality reviews, etc.

GENERAL INFORMATION - ALL CONVENTIONS

1. Wetland determinations will be made on all agricultural lands and non-agricultural lands for participants enrolled in USDA programs. Determinations will be made on all agricultural and non-agricultural lands not enrolled in USDA programs when requests are received.

Note: A Memorandum of Agreement between all signatory agencies within the state is anticipated to define whole farm wetland determination responsibilities for SCS and the COE, respectively.

2. Wetland determinations on non-agricultural lands based on off site mapping conventions will be considered PRELIMINARY. On site wetland determinations/delineations will be done for all non-agricultural bottomland areas indicated as non-wetland where drainage, clearing, or other potential wetland manipulations are scheduled. The landowner will be provided the disclaimer that on site determinations will be needed before such work is to be done. When SCS is informed of such work, the determinations on these non-agricultural bottomland areas will be coordinated with the other signatory agencies. On site determinations of non-agricultural lands utilizing the 1987 Corps of Engineers (COE) Wetlands Delineation Manual will be done by personnel trained in the use of that Manual. Until such time training on the 1987 COE Manual is received, all SCS conducted on site determinations (due to inadequate tools, insufficient data for off site determinations, etc.) on non-agricultural lands will be invalid for the Clean Water Act.
3. All counties will utilize soil surveys and NWI maps as basic tools for conventions, and these tools will be reviewed for all wetland determinations. All other tools identified in the conventions for each county will be developed with technical support from the SCS state and area offices (e.g., flood data and appropriate weather data for selection of ASCS slides will be interpreted by an engineer).
4. Some artificial wetlands may be difficult to determine by remote sensing techniques, such as irrigation seeps and blockages of unimproved roads in forested areas. Most artificial wetlands will be constructed ponds. Ponds placed on undrained hydric soils (wetlands) will be considered wetlands rather than artificial wetlands. Ponds (1.0 acre or larger) constructed on non-hydric soils will be considered artificial wetlands.
5. Size of an area is not part of the wetland criteria. However, areas too small to detect when interpreting aerial photography will not be mapped. NOTE: Artificial wetlands less than one (1.0) acre in size will not be mapped.

6. At any point the reviewing person is satisfied that the area is an upland not containing wetlands, the investigation may be stopped. However, on all riverine sites, including bottomlands and bench soils, and sites that may meet the definition of hydric by flooding or ponding criteria (e.g., A-slope soils on the Cumberland Plateau), the reviewing person will complete all steps of the selected procedure for each wetland determination. Decisions and supporting material will be documented according to what is required in each step of these guidelines. Frequent field checking must be used until the reviewing person has become proficient at photo interpretation in each resource area. The reviewing person will ground truth a minimum of 5 percent of each type of determination mapped by these conventions. Ground truthing will also be done for negative wetland determinations on non-agricultural bottomland areas. The State Wetlands Oversight team will be contacted whenever a significant number of field verifications disagree with the convention (generally 10 percent or more).
7. Any discrepancy between mapping convention tools in the county that cannot be resolved with additional off site data will require an on site determination.
8. Wetland determinations will be made and recorded at ASCS in accordance with the NFSAM.
9. Wetland determinations/delineations will not be made by SCS within the corporate boundaries (city limits) of towns and cities, except for USDA program participants.

METHODOLOGY

The following procedures take into consideration above and below normal precipitation years. The principle tools used to make the wetland determination are: soil survey, USGS quads, weather data, NWI maps, ASCS color slides, the National Aerial Photography Program (NAPP), black and white aerial photos, and satellite imagery. Other maps showing flooded or flood prone areas may also be used.

Procedure 1

This procedure is to be used in those Middle and East Tennessee counties not having a prior SCS wetland inventory or satellite imagery (Appendix B).

1. Review the field office (county) hydric soil list and soil survey. Review of the soil map units which have hydric soils may help identify the areas of the field, farm, or tract having potential for wetlands. Determine if the site is hydric soil map unit or map unit with hydric inclusions or any wet miscellaneous areas or spot symbols such as depressional areas, riverwash, or water areas that meet hydric water table, ponding, or flooding criteria. See Appendix A for hydric soil criteria taken from "The Hydric Soils of the United States".
2. Review USGS quad maps for drainage and other cultural water features (ponds, drainage ditches, etc). Depending on the vintage of quad sheets, altered vs. natural drainage conditions may be determined from present photography. Note: Any wet areas indicated may be greater than that shown on the map because USGS generally maps these areas based on the driest season of the year. Also, the most recent USGS maps should be reviewed. Older maps may show features that no longer exist, and will not show new features that may have developed. USGS quadrangles will have more applicability for identifying artificial wetlands and streams than for wetlands.
3. Review NWI maps. NWI maps will give an overview of the wetlands and artificial wetlands in the area. All wetlands on the NWI map will be considered wetlands or artificial wetlands for these conventions, unless verified non-wetland from on site determinations or because documented data fails to confirm the area as meeting wetland criteria. An example of documented data not supporting the NWI would be where absence of wetness signature indicates the wetland has been drained since the NWI photos were taken. Look for manipulation such as ditches, dikes, or levees. Note: Review of ASCS compliance slides or aerial photographs alone will generally not confirm nor deny forested NWI wetlands.

4. Review ASCS, SCS, and any other original aerial photographs that may be available to the field office. Look for wetness signatures. Note: ASCS and SCS aerial photos are generally taken following the passage of a cold front with heavy rain.
5. Obtain available ASCS color slides (and/or color infrared if available). In most cases, five-seven years will be available in most counties. The flight years to be used in the county will be selected with assistance from the SCS state office after analysis of the appropriate weather data. The SCS state office will use Geological Survey or Weather Service climatological data in conjunction with the ASCS slides. They will review the climatological data to determine those years which were above or below normal precipitation two-three months prior to the date of the slide (Caution: most slides were taken in late June or July). The adopted conventions will be reflective of long-term hydrological conditions, using procedures as outlined in Version 2.0 of the 'Hydrology Tools for Wetland Delineation Handbook' (Appendix C). A minimum of five years of ASCS slides will be reviewed, utilizing an equal number of wet and dry years where necessary. In the event less than five years of slides are available, all available years will be reviewed. One flight year used should be the last available year (1993 or 1994), compared with NWI and other flight years, to update additional artificial wetlands or wetlands that have been converted. One flight year should be 1985 or 1986 to determine those areas converted prior to December 23, 1985. Note: Seasonal flooding or ponding on wetlands will not be confirmed by slides flown at the wrong time of the year, or under dry conditions. A positive wetland indication occurs when wetness signature is evident in dry years, or both wet and dry years. Slides are inconclusive when wetness signatures occur only in wet years, or only in wet and normal years, and additional information will be needed.

Wetness signatures include indications of extended flooding or ponding hydrology on open lands such as standing water, flooded or drowned out crops, stressed crops, differences in vegetation due to different planting dates or different plant communities, unharvested crops, isolated areas not managed like the rest of the field, or patches of lush or greener vegetation. Local soil, climatic, and vegetative factors will influence the extent to which these indicators can be relied upon to indicate ponding or flooding. For example, hydrophytic vegetation may exist in an area due to saturation. Conversely, an area may flood for 15 consecutive days during the growing season (to be defined according to the 3rd Edition of the NFSAM consistent with the 1987 COE Manual) and present no difference in signature from adjacent non-flooded areas.

6. Proper documentation of decisions are required for making wetland determinations. Appendix D provides decision steps that must be followed to make these determinations.

Adequate field reviews must be conducted by county SCS personnel to assure the indicators are accurate in the county. If indicators are not consistently accurate, appropriate on site determinations should be made. To be considered accurate, determinations made from photo signatures and other office information should agree with on site conditions at a minimum 90 percent level of accuracy, with no more than 5 percent margin of error. Determinations not meeting this level of accuracy will be addressed by the State Wetland Oversight team as described on pages 7 and 8 of this document.

Procedure 2

This procedure is to be used in those Middle and East Tennessee counties that do have a prior SCS wetland inventory, but do not have satellite imagery (Appendix B).

1. Review the field office (county) hydric soil list and soil survey. Review of the soil map units which have hydric soils may help identify the areas of the field having potential for wetlands. Determine if the site is hydric soil map unit or map unit with hydric inclusions, or any wet miscellaneous areas or spot symbols such as depressional areas, riverwash, or water areas that meet hydric water table, ponding, or flooding criteria. See Appendix A for hydric soil criteria taken from "The Hydric Soils of the United States".
2. Review USGS quad maps for drainage and other cultural water features (ponds, drainage ditches, etc.). Depending on the vintage of quad sheets, altered vs. natural drainage conditions may be determined from present photography. Note: Any wet areas indicated may be greater than that shown on the map because USGS generally maps these areas based on the driest season of the year. Also, the most recent USGS maps should be reviewed. Older maps may show features that no longer exist and will not show new features that may have developed. USGS quadrangles will have more applicability for identifying artificial wetlands and streams than for wetlands.
3. Review NWI maps. NWI maps will give an overview of the wetlands and artificial wetlands in the area. All wetlands on the NWI map will be considered wetlands or artificial wetlands for these conventions, unless verified non-wetland from on site determinations or because documented data fails to confirm the area as meeting wetland criteria. An example of documented data not supporting the NWI would be where

absence of wetness signature indicates the wetland has been drained since the NWI photos were taken. Look for manipulation such as ditches, dikes, or levees. Note: Review of ASCS compliance slides or aerial photographs alone will generally not confirm nor deny forested NWI wetlands.

4. Review the prior SCS wetland inventory maps. This wetland inventory will provide an indication of flooding or ponding hydrology on agricultural lands based on two-three years of ASCS compliance slides/photographs prior to 1990, but may not be conclusive. (Note: The combination of flight years used in this inventory and additional ASCS slides reviewed must equal a minimum of five years as described in Version 2.0 of the 'Hydrology Tools for Wetland Delineation Handbook'.) This inventory should provide accurate Converted Wetland determinations on those forested areas on mapped hydric soils cleared between 1985 and 1990. When considering the Farmed Wetland determinations indicated in this inventory, cropping histories (ASCS-578 data) or knowledge of the area will be considered to make Farmed Wetland Pasture determinations. This inventory was developed on 1985 aerial photographs in most cases, which will indicate areas converted prior to December 23, 1985.

5. Obtain available ASCS color slides (and/or color infrared if available) for the latest two years (1993 and 1994; 1992 and 1993) to confirm Converted Wetlands between 1990 and 1994, flooding, or ponding hydrology for agricultural lands, and new ponds constructed on nonhydric soils. Note: A comparison of NWI wetlands and these slides will also be required to determine Converted Wetlands. The SCS state office will use Geological Survey or Weather Service climatological data in conjunction with the ASCS slides to review the climatological data and determine if these years were above or below normal precipitation two-three months prior to the date of the slide (Caution: most slides were taken in late June or July). This will determine the validity of these two flight years for indicating flooding or ponding hydroperiods. If these flight years are not valid hydroperiod indicators due to weather patterns, additional flight years will need to be reviewed. The adopted conventions will be reflective of long-term hydrological conditions, using procedures as outlined in Version 2.0 of the 'Hydrology Tools for Wetland Delineation Handbook' (Appendix C). Note: Seasonal flooding or ponding on wetlands will not be confirmed by slides flown at the wrong time of the year, or under dry conditions. A positive wetland indication occurs when wetness signature is evident in dry years, or both wet and dry years. Slides are inconclusive when wetness signatures occur only in wet years, or only in wet and normal years, and additional information will be needed.

Wetness signatures include indications of extended flooding or ponding hydrology on open lands such as standing water, flooded or drowned out crops, stressed crops, differences in vegetation due to different planting dates or different plant communities, unharvested crops, isolated areas not managed like the rest of the field, or patches of lush or greener vegetation. Local soil, climatic, and vegetative factors will influence the extent to which these indicators can be relied upon to indicate ponding or flooding. For example, hydrophytic vegetation may exist in an area due to saturation. Conversely, an area may flood for 15 consecutive days during the growing season (to be defined according to the 3rd Edition of the NFSAM consistent with the 1987 COE Manual) and present no difference in signature from adjacent non-flooded areas.

6. Proper documentation of decisions are required for making wetland determinations. Appendix D provides decision steps that must be followed to make these determinations.

Adequate field reviews must be conducted by county SCS personnel to assure the indicators are accurate in the county. If indicators are not consistently accurate, appropriate on site determinations should be made. To be considered accurate, determinations made from photo signatures and other office information should agree with on site conditions at a minimum 90 percent level of accuracy, with no more than 5 percent margin of error. Determinations not meeting this level of accuracy will be addressed by the State Wetland Oversight team, as described on pages 7 and 8 of this document.

Procedure 3

This procedure is to be used in West Tennessee where prior SCS wetland inventory maps and satellite imagery are available. If adequate satellite imagery is not available, procedure 2 will be used in West Tennessee (Appendix B).

- Review soil surveys.
- Review satellite imagery.
- Review NWI maps.
- Review prior SCS wetland inventory for converted wetlands.
- Review latest year available ASCS compliance slides to update converted wetlands and artificial wetlands.
- Interpret data, make decision, and document decision.

1. Review the field office (county) hydric soil list and soil survey. Review of the soil map units which have hydric soils may help identify which areas of the field have potential for wetlands. Determine if the site is hydric soil map unit or map unit with hydric inclusions, or any wet miscellaneous areas or spot symbols such as depressional areas, riverwash, or water areas that meet hydric water table, ponding, or flooding criteria. See Appendix A for hydric soil criteria taken from "The Hydric Soils of the United States."
2. Review appropriate satellite data using these procedures outlined below:
 - a. Data prior to and after December 23, 1985, is needed to establish if the area was agricultural land prior to implementation of the Food Security Act. Data for at least two years, and preferably five years, is needed at appropriate intervals to establish flooding or ponding occurrences on agricultural lands. Rainfall variations, cloud cover, and other factors are critical in data selection.
 - b. Process the data using appropriate software. "Multitemporal Classification" techniques are used to eliminate existing vegetated wetlands, permanent water bodies, ponds, and other non-agricultural areas.
 - c. Select imagery from appropriate years and correlate this with stream gage data to represent the elevations of the two-year flood (50 percent occurrence) which was present for 15 consecutive days. Areas delineated by this process are identified as farmed wetlands. Note: If the use of satellite imagery is expanded into Middle and East Tennessee in the future, identification of Farmed Wetland Pastures will require satellite imagery reflecting flooding or ponding for seven consecutive days during the growing season in most years.

NOTE: Details concerning use of this methodology should be obtained from experienced sources. Areas less than one (1) acre in size, cannot be identified by this procedure. Some agricultural lands such as rice fields may be incorrectly identified by this process. Adequate ground truthing is necessary throughout this procedure to assure that final accurate results are obtained. Ground truthing should be correlated with soil survey information.

Alternative strategy to select the proper scene from satellite imagery to verify agricultural areas prone to flooding and ponding hydroperiods of adequate duration to meet the farmed wetland definition.

- a. Identify a storm event that is a general rain (area wide instead of isolated thunderstorms) and a two-year storm event.
- b. Select for the target storm event to be immediately following a two-three month period of normal rainfall patterns.
- c. Determine the geographical boundaries of the target storm event (weather station data comparison for the target storm event).
- d. Purchase the scene at the start of out of bank flow, and an additional scene 16 days after.

Note open areas meeting appropriate flooding or ponding hydroperiod and duration as farmed wetlands or farmed wetland pastures regardless of the soil map unit that may be indicated in the soil survey. In addition, if the satellite imagery reflects appropriate flooding or ponding on non-agricultural areas visible prior to spring leaf out, these areas will be inventoried as wetlands regardless of soil map unit that may be indicated in the soil survey.

3. Review NWI maps. NWI maps will give an overview of the wetlands and artificial wetlands in the area. All wetlands on the NWI map will be considered wetlands or artificial wetlands for these conventions, unless verified nonwetland from on site determinations or because documented data fails to confirm the area as meeting wetland criteria. An example of documented data not supporting the NWI would be where absence of wetness signature indicates the wetland has been drained since the NWI photos were taken. Look for manipulation such as ditches, dikes, or levees.
4. Review the prior SCS wetland inventory maps. This wetland inventory will provide an indication of converted wetlands on those forested areas on mapped hydric soils cleared between 1985 and 1990. It was developed on 1985 aerial photographs in most cases, which will indicate areas converted prior to December 23, 1985.
5. Review the latest year (1993 or 1994) ASCS compliance slides available to update and inventory converted wetlands and artificial wetlands. If abandonment appears to be the situation, additional ASCS flight years will be reviewed to verify abandonment or potential changes in size of the wetland area.

6. Proper documentation of decisions are required for making wetland determinations. Appendix D provides decision steps that must be followed to make these determinations.

Adequate field reviews must be conducted by county SCS personnel to assure satellite imagery is accurate in the county. If imagery is not consistently accurate, appropriate on site determinations should be made. To be considered accurate, determinations made from satellite imagery and other off site tools should agree with on site conditions at a minimum 90 percent level of accuracy, with no more than 5 percent margin of error. Determinations not meeting this accuracy level will be addressed by the State Wetland Oversight team, as described on pages 7 and 8 of this document.

MAPPING CONVENTION I - PRIOR CONVERTED CROPLAND

Definition: Prior converted croplands are wetlands that were drained, dredged, filled, leveled, or otherwise manipulated before December 23, 1985, for the purpose of, or to have the effect of, making the production of an agricultural commodity possible, and do not meet farmed wetland criteria.

Mapping Convention Symbol (PC)

To be considered prior converted cropland wetlands occurring on saturated, ponded, or flooded hydric soils must meet all of the following criteria:

Before December 23, 1985, were:

1. Drained or otherwise manipulated, and/or had woody vegetation removed.
2. Have produced an agricultural commodity between 12/23/80 and 1985.
3. Have not been abandoned.
4. Do not flood or pond for 15 consecutive days during the growing season in most years.

ASCS records may be used to determine if an agricultural commodity (crop that requires annual planting) was produced prior to 1985. In the absence of ASCS records and for non-program participants, documentation of cropping history should be based on aerial photography, crop expense or receipt records, or other suitable documentation.

Making production possible means the use of any practice that results in the growth of annual crops by subjecting the land to intensive management such that the natural hydrophytic vegetation is suppressed (e.g., bushhogging, disking). Abandonment is the cessation of cropping, management, or maintenance operations for five consecutive years, such that: (1) wetland criteria are met; (2) the area has not been enrolled in a non-permanent easement conservation set-aside program; and (3) the area has not been enrolled in a non-permanent easement state or federal wetland restoration program. The area may also be considered abandoned if the landowner provides written intent to abandon the area and wetland criteria are met. This definition of abandonment is applicable for FACTA activities; CWA regulations may describe different criteria for abandonment.

MAPPING CONVENTION II - FARMED WETLAND

Definition: Farmed wetlands are wetlands that were drained, dredged, filled, leveled, or otherwise manipulated before December 23, 1985, for the purpose of, or to have the effect of, making the production of an agricultural commodity possible, and continue to meet specific hydrologic criteria.

Mapping Convention Symbol (FW or FWP)

To be considered farmed wetlands, all the following criteria must be met:

1. The area seasonally ponds or floods for at least 15 consecutive days during the growing season, or 10 percent of the growing season, whichever is less under average conditions (50 percent chance of occurrence).
2. Production was not possible before the manipulation.
3. An agricultural commodity has been produced at least once.
4. The area has not been abandoned. Duration of flooding or ponding will be considered present when appropriate wetness signatures are present.

Included in this convention are lands that could be identified by SCS as Farmed Wetland Pastures when official wetland determinations are done for FACTA. Farmed wetland pastures or hayland are wetlands that were manipulated and used for pasture, hay, or other forage production prior to December 23, 1985, still meet wetland criteria, and are not abandoned. These areas also include prior converted croplands or farmed wetlands that were converted to cropland before 1981, but were not planted to an agricultural commodity or in set aside in any year 1981 through 1985, or have not been planted to an agricultural commodity in the past five (5) years, but have been used for pasture and hay production, still meet wetland criteria, and have not been abandoned. Farmed wetland pastures meet wetland hydrology criteria if inundated for seven (7) consecutive days or saturated for 14 consecutive days during the growing season.

Although wetland hydrology criteria differs between farmed wetlands and farmed wetland pastures, cropping, crop histories, and set aside records will be difficult if not impossible to accurately photo interpret. ASCS records of cropping histories will be inadequate for USDA non-program participants or program participants with non-subsidized crops. Farmed wetland pastures reflect a difference in land use, but likely no difference in wetness signature from farmed wetlands, because the tools to be utilized in Middle and East Tennessee where farmed wetland pastures primarily occur verify seasonality of hydroperiods rather than duration. Farmed wetland pastures will be indicated for those areas meeting the convention's hydrology indicators and

cropping criteria when ASCS crop records are available, or personal knowledge allows for cropping interpretations when making the off site determination. Where crop histories are not available and cropping is not verified, the assumption will be made that the area has never been cropped.

MAPPING CONVENTION III - CONVERTED WETLAND

Definition: Converted wetland is land that meets the criteria of (1) was wetland; (2) was neither highly erodible land, nor highly erodible cropland; (3) after December 23, 1985, has been drained, dredged, filled, leveled, or otherwise manipulated, including any activity that results in impairing or reducing the flow, circulation, or reach of water; (4) the production of an agricultural commodity was made possible or increased production was made possible on farmed wetlands by making an area farmable in more years than it previously was or yields were increased because of reduced crop stress due to wetness.

Mapping Convention Symbol (CW or CW+Year)

When the Food Security Act was signed in 1985, it provided that persons shall be ineligible for USDA benefits if an agricultural commodity is planted on wetland that was converted after December 23, 1985. When FACTA was signed, additional restrictions were imposed for land converted after November 28, 1990. For this reason, SCS is required to determine whether a wetland was converted before or after November 28, 1990. Conversions made after 1990 are labeled CW+Year. Manipulation is the alteration of hydrology and/or the removal of woody vegetation, and includes any action which removes water from a wetland. Converted wetlands occur on naturally vegetated wetlands (W), farmed wetlands (FW), and farmed wetland pastures (FWP). When discernible alteration has occurred, wetland determinations for converted areas on non-agricultural lands will be conducted on site using the guidance in the 1987 COE Manual.

MAPPING CONVENTION IV - ARTIFICIAL WETLANDS

Definition: Land that was formerly non-wetland in its natural state or was prior converted cropland that now exhibits wetland characteristics because of human activities. These areas are exempt from the FACTA wetland provisions and may be drained without loss of USDA program eligibility. Manipulations of artificial wetlands may still be subject to provisions of the CWA. NOTE: Wetland restoration areas and mitigation wetlands developed due to CWA or FACTA program requirements are not considered artificial wetlands.

Mapping Convention Symbol (AW)

Artificial enhancement of the hydrology on existing wetland does not make such wetland an AW. Removal of enhanced hydrology is allowed as long as the original wetland hydrology is not removed. A wet area created by an irrigation system is considered an AW. Ponds constructed on non-hydric soils (exceeding 1.0 acre in size) are considered an AW. Artificial wetlands include wetland created for purposes such as:

- livestock watering
- fish production
- irrigation
- rice production
- flood control
- recreation
- wildlife habitat

Beavers are considered natural, and non-wetland or prior converted cropland areas which meet wetland criteria due to their activity are considered wetlands, not artificial wetlands.

MAPPING CONVENTION V - WETLANDS

Definition: FACTA wetlands are wetlands that meet wetland criteria, have not been manipulated, and have not had the water regime altered or woody vegetation removed. CWA wetlands include natural and artificial wetlands where inundation or saturation occurs at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of hydrophytic vegetation.

Wetland hydrology criteria under FACTA is inundation of seven (7) or more consecutive days during the growing season in most years (50 percent chance or more) or saturation at or near the surface for fourteen (14) or more consecutive days during the growing season. Soils are considered saturated to the surface in accordance with Appendix A. Wetland hydrology criteria under CWA differs slightly with inundation or saturation, indicating wetlands when exceeding 5 percent of the growing season.

Wetlands include abandoned prior converted croplands where sufficient hydrology has returned, abandoned farmed wetlands, and abandoned farmed wetland pastures.

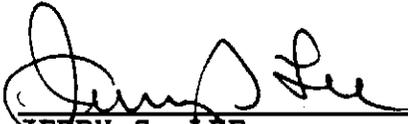
Mapping Convention Symbol (W)

Wetlands may be planted to produce an agricultural commodity under natural conditions after December 23, 1985, as long as all the following requirements are met:

- Production is made possible as a result of a natural condition, such as drought.
- Water regimes are not altered.
- Woody vegetation is not removed.
- Tillage does not fill, level, or otherwise cause conversion of the wetland.

Note: Removal of herbaceous vegetation is not considered removal of a wetland characteristic.

WITNESS WHEREOF, the parties hereto concur in the above wetland mapping conventions, in accordance with the National Wetlands MOA signed January 6, 1994.



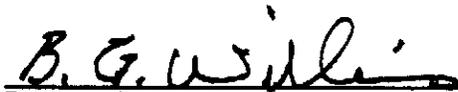
JERRY S. LEE
STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE

August 4, 1994
DATE



LEE BARCLAY
FIELD SUPERVISOR
U.S. FISH AND WILDLIFE SERVICE

August 9, 1994
DATE



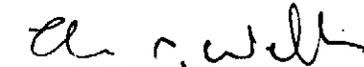
B. G. WILLIAMS
CHIEF OF CONSTRUCTION/
OPERATIONS DIVISION
U.S. ARMY CORPS OF ENGINEERS
MEMPHIS DISTRICT

15 Aug 94
DATE



DANIEL F. HALL, CHIEF
OPERATIONS, CONSTRUCTION, AND
READINESS DIVISION
U.S. ARMY CORPS OF ENGINEERS
NASHVILLE DISTRICT

August 5, 1994
DATE



THOMAS C. WELBORN
CHIEF, WETLANDS PROTECTION SECTION
ENVIRONMENTAL PROTECTION AGENCY, REGION IV

8/10/94
DATE

APPENDIX A

Definition of Hydric Soil - A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. The following criteria reflect those soils that meet this definition.

Criteria for Hydric Soils

1. All Histosols except Folists; or
2. Soil in Aquic suborder, Aquic subgroups, Albolls suborder, Salorthids great group, Pill great groups of Vertisols, Pachic subgroups, or Cumulic subgroups that are:
 - a. Somewhat poorly drained and have either
 - (1) a frequently occurring water table at less than 0.5 feet from the surface for a significant period (usually more than two weeks) during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches or for other soils;
 - (2) a frequently occurring water table at less than 1.0 (ft) from the surface for a significant period (usually more than 2 weeks) during the growing season if permeability is equal to or greater than 6.0 in/hour (in/h) in all layers within 20 in, or
 - (3) a frequently occurring water table at less than 1.5 feet from the surface for a significant period (usually more than two weeks) during the growing season if permeability is less than 6.0 (in/h) in any layer within 20 inches.
3. Soils that are frequently ponded for long duration or very long duration during the growing season.
4. Soils that are frequently flooded for long duration or very long duration during the growing season.

APPENDIX B

List of Counties to use Procedure 1 of Mapping Conventions:

ANDERSON	MCMINN
BLEDSON	MACON
CAMPBELL	MARSHALL
CARTER	HEIGS
CLAIBORNE	MONROE
CLAY	MOORE
COCKE	MORGAN
DAVIDSON	OVERTON
DEKALB	PICKETT
FENTRESS	POLK
GRAINGER	ROANE
GRUNDY	SCOTT
HANCOCK	SEQUATCHIE
HAWKINS	SEVIER
JACKSON	SULLIVAN
JEFFERSON	TROUSDALE
JOHNSON	UNICOI
KNOX	UNION
LEWIS	WILSON
LOUDON	

List of Counties to use Procedure 2 of Mapping Conventions:

BEDFORD	MARION
BLOUNT	MAURY
BRADLEY	MONTGOMERY
CANNON	PERRY
CHEATHAM	PUTNAM
COFFEE	RHEA
CUMBERLAND	ROBERTSON
DICKSON	RUTHERFORD
FRANKLIN	SMITH
GILES	STEWART
GREENE	SUMNER
HAMBLEN	VAN BUREN
HAMILTON	WARREN
HICKMAN	WASHINGTON
HOUSTON	WAYNE
HUMPHREYS	WHITE
LAWRENCE	WILLIAMSON
LINCOLN	

APPENDIX B (Cont'd.)

List of Counties to use Procedure 3 of Mapping Conventions:

BENTON
CARROLL
CHESTER
CROCKETT
DECATUR
DYER
FAYETTE
GIBSON
HARDEMAN
HARDIN
HAYWOOD

HENDERSON
HENRY
LAKE
LAUDERDALE
MADISON
MCNAIRY
OBION
SHELBY
TIPTON
WEAKLEY

APPENDIX C

TENNESSEE
 CLIMATIC DATA STATIONS FOR WETLAND DETERMINATIONS
 JANUARY 11, 1994

	<u>COUNTY</u>	<u>STATION NAME</u>	<u>STATION NO.</u>
1.	ANDERSON	OAK RIDGE ATDL	6750
2.	BEDFORD	SHELBYVILLE 3	8246
3.	BENTON	HUNTINGTON WTR PLT	4417
4.	BLEDSE	PIKEVILLE	7184
5.	BLOUNT	KNOXVILLE WSO AP	4950
6.	BRADLEY	CLEVELAND 6 NNE	1808
7.	CAMPBELL	NORRIS	6619
8.	CANNON	WOODBURY 1 WNW	9866
9.	CARROLL	HUNTINGTON WTR PLT	4417
10.	CARTER	MOUNTAIN CITY 2	6292
11.	CHEATHAM	KINGSTON SPRINGS	4876
12.	CHESTER	JACKSON EXP STN	4561
13.	CLAIBORNE	TAZEWELL	8868
14.	CLAY	CELINA	1561
15.	COCKE	NEWPORT 1 NW	6534
16.	COFFEE	TULLAHOMA	9155
17.	CROCKETT	BROWNSVILLE	1145
18.	CUMBERLAND	CROSSVILLE FAA AP	2197
19.	DAVIDSON	NASHVILLE WSA AP	6402
20.	DECATUR	LEXINGTON	5210
21.	DEKALB	COOKEVILLE	2009
22.	DICKSON	DICKSON	2489
23.	DYER	NEWBERN	6471
24.	FAYETTE	MOSCOW	6274
25.	FENTRESS	ALLARDT	0081
26.	FRANKLIN	TULLAHOMA	9155
27.	GIBSON	MILAN	6012
28.	GILES	PULASKI WATER PLANT	7459
29.	GRAINGER	TAZEWELL	8868
30.	GREENE	GREENEVILLE EXP STN	3679
31.	GRUNDY	MONTEAGLE	6162
32.	HAMBLEN	ROGERSVILLE 1 NE	7884
33.	HAMILTON	CHATTANOOGA WSO AP	1656
34.	HANCOCK	TAZEWELL	8868
35.	HARDEMAN	BOLIVAR WTR WKS	0876
36.	HARDIN	SAVANNAH 6 SW	8108
37.	HAWKINS	ROGERSVILLE 1 NE	7884
38.	HAYWOOD	BROWNSVILLE	1145
39.	HENDERSON	LEXINGTON	5210
40.	HENRY	PARIS 2 NW	6977
41.	HICKMAN	CENTERVILLE WTR PLT	1587
42.	HOUSTON	WAVERLY 4 W	9492
43.	HUMPHREYS	WAVERLY 4 W	9492
44.	JACKSON	COOKEVILLE	2009
45.	JEFFERSON	KNOXVILLE WSO AP	4950
46.	JOHNSON	MOUNTAIN CITY 2	6292

APPENDIX C (Cont'd.)

<u>COUNTY</u>	<u>STATION NAME</u>	<u>STATION NO.</u>
47. KNOX	KNOXVILLE WSO AP	4950
48. LAKE	SAMBURG WL REF	8065
49. LAUDERDALE	RIPLEY	7710
50. LAWRENCE	LAWRENCEBURG FLT PL	5089
51. LEWIS	MOUNT PLEASANT 2 SW	6340
52. LINCOLN	FAYETTEVILLE	3074
53. LOUDON	LENOIR CITY	5158
54. MCMINN	ATHENS	0284
55. MCNAIRY	SELMER	8160
56. MACON	LAFAYETTE	4987
57. MADISON	JACKSON EXP STN	4561
58. MARION	BRIDGEPORT, ALABAMA	1099
59. MARSHALL	LEWISBURG EXP STN	5187
60. MAURY	COLUMBIA 3 WNW	1957
61. MEIGS	ATHENS	0284
62. MONROE	ATHENS	0284
63. MONTGOMERY	CLARKSVILLE SEW PLT	1790
64. MOORE	TULLAHOMA	9155
65. MORGAN	ONEIDA	6829
66. OBION	UNION CITY	9219
67. OVERTON	LIVINGSTON RADIO	5332
68. PERRY	LINDEN 2	5278
69. PICKETT	CELINA	1561
70. POLK	COPPERHILL	2024
71. PUTNAM	COOKEVILLE	2009
72. RHEA	DAYTON	2360
73. ROANE	ROCKWOOD 2	7834
74. ROBERTSON	SPRINGFIELD EXP STN	8562
75. RUTHERFORD	MURFREESBORO 5 N	6371
76. SCOTT	ONEIDA	6829
77. SEQUATCHIE	PIKEVILLE	7184
78. SEVIER	SEVIERVILLE 1 SE	8179
79. SHELBY	COVINGTON 1 W	2108
80. SMITH	CARTHAGE	1480
81. STEWART	DOVER 1 W	2589
82. SULLIVAN	KINGSPORT	4858
83. SUMNER	PORTLAND SEWAGE PLT	7359
84. TIPTON	COVINGTON 1 W	2108
85. TROUSDALE	LAFAYETTE	4987
86. UNICOI	MOUNTAIN CITY 2	6292
87. UNION	NORRIS	6619
88. VAN BUREN	SPARTA	8522
89. WARREN	MCMINNVILLE	5882
90. WASHINGTON	GREENEVILLE EXP STN	3679
91. WAYNE	WAYNESBORO	9502
92. WEAKLEY	DRESDEN	2600
93. WHITE	SPARTA	8522
94. WILLIAMSON	FRANKLIN SEWAGE PLT	3280
95. WILSON	LEBANON 3 W	5108

SUPPLEMENTAL DATA FOR REMOTE SENSING

APPLICABLE SITUATIONS FOR USE

The tool provides procedures to help document the hydrology associated with mapping conventions. This documentation also helps to determine which years of aerial photograph signatures can be correlated with hydrology of natural wetlands and independent validation of the hydrology. The procedures are;

1. use of precipitation data to help select the years that signatures might be seen on aerial photos
2. use of precipitation to document the frequency of signature in humid climates
3. use of runoff volumes to document wetland hydrology in semiarid areas, such as western Kansas.

DATA REQUIRED

The data required is:

1. Daily or monthly precipitation for a long term nearby climatic station for procedures 1 and 2
2. Daily or monthly runoff volume for procedure 3

LIMITATIONS

Knowledge & Experience Needed

General knowledge of climate, wetland signatures and how to interpret rain and runoff data

Climatic Regions of Applicability

All regions for procedures 1 and 2
semiarid for procedure 3

Factors Affecting the Accuracy of Results

The accuracy of the hydrometeorological data has a significant impact on the results.

Saturation and/or inundation has to be observed for a specified duration and frequency during the growing season to establish that the wetland hydrology criterion has been met. An aerial photograph only represents conditions at that point and time. An aerial photograph used alone will not provide sufficient information to

establish that the wetland hydrology criterion has been met.

The existence of normal hydrological conditions needs to be established for proper interpretation of wetland signatures on aerial photographs. Runoff data provides the best information for this type of documentation, but is seldom available. Precipitation data is widely available for long periods of time and may be used to determine the hydrologic conditions.

SOURCE OF INFORMATION

Precipitation data can be obtained from the FOCS CLIMSYS climate data base or from the Climate Data Access Facility in the West Technical Center in Portland, Oregon. The State Climate Data Liaison (CDL) in the state office has the procedure for obtaining the needed data.

Various types of stream gage data are published. These include mean daily discharge, mean daily stage, peak stage and discharge for flood events, and mean daily lake level. The primary sources for these data are the USGS Water Resources Data publications for each state. Stream and lake gage readings are also available from Corps of Engineers, TVA, USGS, NOAA, Bureau of Reclamation, various highway departments, and state or local public works agencies.

Various computer models can also be used to determine the daily runoff volumes. This approach is discussed in the previous section.

REFERENCES

SCS, National Engineering handbook , Section 4 (NEH-4)
SCS, FOCS Water Budget Module Users Manual, (in press)
SCS, FOCS CLIMSYS Users Manual (in Press)
SCS, Climatic Data Liaison Reference Manual (in press)

METHODOLOGY

Procedure 1 may be used to analyze precipitation records to determine if the aerial photograph wetland signature represents correlation with normal hydrological conditions.

1. Select aerial photographs for the growing season for the area in question. Use a minimum of 5 years of flights.
2. Obtain the annual precipitation data associated with the aerial photographs.
3. Determine the conditions were wet, dry and average for the selected years. Average annual precipitation is

within the plus or minus 3 year in 10 year precipitation for the current 30 year normal. A wet year is when the precipitation is greater than 3 year in 10 year precipitation. A dry year is when the precipitation is less than the 3 year in 10 year precipitation.

4. Select aerial photographs so that an equal number of wet and dry than the normal year precipitation are in the sample. This is an approximate method of depicting the average condition. However always review the signatures in all available years of flights.
5. Correlate mapping conventions (signature) with the precipitation data. If the signature occurred in both wet and dry years, the area is wet. If the signature only occurred in wet years additional review of the signature is needed. If the signature occurred in wet and normal years, the area needs additional study.

The methodology for procedure 2 involves the use of work sheets 1 and 2. Procedure 2 can be used to document frequency of inundation when making wetland determination on depressional areas in humid climates. This procedure should not be used were the growing season precipitation is limited and occurs on a random basis. Western Kansas is a good example of this situation.

Sheet 1. "Rainfall Documentation" (Complete one sheet for each selected year).

1. Complete work sheet 1 using the climate station nearest to the site. Growing season precipitation data can be obtained from Climate Data Access Network (CDAN). The state Climate Data Liaison has the procedure for obtaining the needed data.
2. Complete general information.
3. Enter the first month before the photograph was taken on the first line of the month column. Enter preceding months on line 2 and 3.
4. Enter "Long Term Rainfall Records" for each of the months. Information is obtained from CDAN. "Rainfall" column is for "on-site" rainfall or nearest gage reading for the appropriate months.
5. "Condition" columns enter "Dry" if the on-site rainfall column is less than the "3 year in 10 less than" Column. Enter "Wet" if the on site rainfall is greater than shown in the "3 year in 10 more than" column. Enter "Normal" if the on site rainfall is between the

APPENDIX C (Cont'd.)

February 23, 1994

rainfall shown in the "3 year in 10 less than" and "3 year in 10 more than" columns.

6. "Condition Value" column is to tabulate the appropriate "condition value" as shown below the table.
7. Multiply the "condition value" by the "Month Weight Value" and enter the product in the last column. Sum the last column.
8. Determine if the rainfall period before the photo has been normal or not. One may also reject the use of any year's records if some unusual events occurred or records are not properly documented.

Sheet 2. "Summary and Conclusion" (This sheet is to provide a summary of the years of information recorded on each sheet 1 and to document the thought process for concluding if wetland hydrology exists for depressional areas).

1. Complete general information.
2. Complete first 5 columns of table using information from sheet 1. View appropriate photo and indicate in column 6 if wetland hydrology signature was observed. Comments should be entered in column 7.
3. The information in the 3 narrative paragraphs is to be completed from the data. Circle either "does" or "does not" in the fourth narrative paragraph. Correlate mapping conventions (signature) with the precipitation data. If the signature occurred in both wet and dry years, the area is wet. If the signature only occurred in wet years additional review of the signature is needed. If the signature occurred in wet and normal years, the area needs additional study.

February 23, 1994

**RAINFALL DOCUMENTATION
USE WITH PHOTOGRAPHS**

DATE: _____ PREPARED BY: _____

WEATHER STATION: _____ LANDOWNER: _____ TRACT NO: _____

COUNTY: _____ STATE: _____

SOIL NAME: _____ GROWING SEASON: _____

PHOTO DATE: _____

MONTH	LONG TERM RAINFALL RECORDS			RAIN FALL	CONDITION DRY, WET, NORMAL	CONDITION VALUE	MONTH WEIGHT VALUE	PRODUCT OF PREVIOUS TWO COLUMNS
	3 YRS IN 10 LESS THAN AVERAGE	3 YRS IN 10 MORE THAN						
1ST PRIOR MONTH*							3	
2ND PRIOR MONTH*							2	
3RD PRIOR MONTH*							1	

SUM =

Condition Value:
Dry = 1
Normal = 2
Wet = 3

NOTE: If sum is
6 - 9 then prior period has been drier than normal
10 - 14 then prior period has been normal
15 - 18 then prior period has been wetter than normal
* Photo Date

CONCLUSIONS:

APPENDIX C (Cont'd.)

The methodology for procedure 3 follows. Procedure should be used in those area were the growing season precipitation is random and limited. A good example is western Kansas

1. Obtain the long term monthly surface runoff volumes using one of the runoff volume tools discussed in the previous section. Sum the monthly runoff volumes for the growing season for each year.
2. Develop a frequency curve of growing season surface runoff volumes using statistical techniques. The statistical techniques are outlined in Chapter 18, National Engineering Handbook, Section 4, Hydrology (NEH-4).
3. Obtain the available ASCS aerial photographs and note the flight dates. Use only one photograph per year. The selected photograph should represent the growing season, if possible.
4. Determine the per cent chance of occurrence for the seasonal surface runoff for each selected year.
5. Determine surface runoff for the period of concern before the ASCS photograph dates using the procedures in Step 1 or 2.
6. Determine the per cent chance of occurrence for the period from the frequency curves developed in either Step 1 or 2.
7. Develop a table for the selected events using the following format;

TABLE 1

Years	Surface Runoff Occurrence %	Wet Year	Hits
-----	-----	----	----
1990	10	X	H
1989	5	X	H
1988	75		
1987	65		
1986	30	X	H
	NUMBER	3	3

8. A wet runoff season exists if the percent chance of occurrence is smaller than 50 percent

Record a mark in the Hit column, if a positive hit can be identified for the year. A positive hit on the

February 23, 1994

ASCS slide is indication of ponding, saturation, or other signature on the slide.

9. If there are more hits than wet years, the wetland may be caused by imported water or supported by ground water. If the number of hits is less than the number of wet years, the wetland is being starved, drained, or the drainage area may not be large enough to support a wetland.

SAMPLE DOCUMENTATION

Sample 1. Sample 1 is documentation for procedure 1. In Nelson County, there are several years of aerial photographs with wetland signatures that need correlation with hydrology. The normal annual precipitation for Nelsonville in Nelson County is 23.6 in for 1961 - 1990. The 3 year in 10 year precipitation is 17.7 and 29.5 inches respectively.

YEAR	TOTAL PRECIPITATION		PHOTOS
	INS	3 in 10yr	
1961	29.1	N	
1962	16.7	D	
1963	18.9	N	
1964	23.5	N	
1965	22.9	N	
1966	22.1	N	
1967	25.8	N	
1968	24.2	N	
1969	31.3	W	
1970	16.2	D	
1971	15.8	D	
1972	21.9	N	
1973	22.6	N	
1974	24.9	N	
1975	29.8	W	
1976	30.0	W	
1977	23.9	N	
1978	22.3	N	
1979	25.7	N	
1980	25.7	N	
1981	20.9	N	
1982	25.4	N	
1983	22.1	N	
1984	17.5	D	Y
1985	16.2	D	Y
1986	24.8	N	Y
1987	23.8	N	Y
1988	29.6	W	Y
1989	23.1	N	Y
1990	31.3	W	Y
NORMAL	23.6		

In this example, 1984, 1985, 1988, 1989, and 1990 were selected to correlate signature with precipitation. This would be the minimum number of flights to use. The correlation of the signatures with the information would be improved by using the all the available flights.

APPENDIX D

DECISION GUIDES FOR OFF SITE WETLAND DETERMINATIONS AND DETERMINING HYDROLOGY CRITERIA

GENERAL REQUIREMENTS - ALL PROCEDURES

The data below is required for all off site determinations:

1. County Soil Survey
2. National Wetland Inventory Map
3. Knowledge of Landscape Position/Slope of the Site (Taken from Soil Survey and/or Topographic Map)

Determinations involving an area situated within a floodplain or with a slope less than 3 percent requires hydrology data for prior converted cropland or non-wetland determinations (hydrology data selected for use by a county must be approved by the State Wetland Oversight team).

HYDROLOGY DATA

(Hydrology Tools and General Requirements)

1. Satellite Imagery - 2-year storm, 15-day duration scene
2. Stream Gauge Data - 2-year storm, unchannelized stream
3. Calculated Flood Line
Hydrology Tools Handbook, Version 2.0 Methodology for
Runoff Volumes - unchannelized stream
4. SCS Wetland Inventory
Farmed wetlands accepted
additional ASCS flight years will be investigated
5. ASCS Slides/Aerial Photographs
Wetness signature
dry years - wetland
normal or wet years- potential wetland (may need on site)
lacking all years - non-wetland or PC
pre-1985 but not after 1985 - PC or CW (depending on
when hydrology removed)

WETNESS SIGNATURE:

Standing Water
Flooded or Drowned out Crops
Stressed Crops
Differences in Vegetation (not set-aside)
Unharvested Crops
Isolated Areas Within a Field not Managed Similarly
(usually irregular boundary)

APPENDIX D (Cont'd.)

DECISION GUIDE FOR MAKING A WETLAND DETERMINATION

1. IS SITE WITHIN A FLOODPLAIN, DEPRESSION, OR AREA OF LESS THAN 3 PERCENT SLOPE?

IF YES, POTENTIAL WETLAND - GO TO 2
IF NO - GO TO 3

2. IS HYDRIC SOIL OR SOIL WITH A POTENTIAL INCLUSION OF HYDRIC SOIL ON SITE?

IF YES, POTENTIAL WETLAND - GO TO 4
IF NO - GO TO 7

3. IS SITE INDICATED AS A WETLAND ON NATIONAL WETLAND INVENTORY?

IF YES, ARTIFICIAL WETLAND (AREA MAPPED POW/PUB) OR WETLAND (SEEPS)
IF NO, NONWETLAND (EXCEPTIONS: SEEP/BEAVER POND) - GO TO 7)

4. IS SITE ON NON-AGRICULTURAL LAND (E.G., WOODLAND)?

IF YES - GO TO 6
IF NO - GO TO 5

5. IS HYDROLOGY CRITERIA FOR THE SITE MET (SEE HYDROLOGY DECISION TABLE)?

IF YES, FARMED WETLAND OR FARMED WETLAND PASTURE
IF NO AND SOIL IS HYDRIC MAP UNIT - PRIOR CONVERTED
IF NO AND SOIL MAY CONTAIN INCLUSION - NON-WETLAND
IF UNKNOWN - POTENTIAL WETLAND *

6. IS SITE WITHIN A WETLAND MAPPED BY NATIONAL WETLAND INVENTORY?

IF YES, WETLAND
IF NO AND SOIL IS HYDRIC MAP UNIT, WETLAND
IF NO AND HYDRIC INCLUSION SOIL, POTENTIAL WETLAND - GO TO 7

7. IS HYDROLOGY CRITERIA FOR THE SITE MET (SEE HYDROLOGY DECISION TABLE)?

IF YES, WETLAND, FARMED WETLAND, OR FARMED WETLAND PASTURE
IF NO AND SITE IS AGRICULTURAL LAND, NON-WETLAND
IF NO OR UNKNOWN AND SITE IS NON-AGRICULTURAL LAND, POTENTIAL WETLAND *
IF UNKNOWN, POTENTIAL WETLAND *

- * A FINAL DECISION FOR A "POTENTIAL WETLAND" INDICATES THAT AN ON SITE WETLAND DETERMINATION IS REQUIRED.

APPENDIX D, (Cont'd.)

DECISION GUIDE FOR DETERMINING IF HYDROLOGY CRITERIA IS MET

1. IS DETERMINATION FOR AGRICULTURAL LAND?

IF YES - GO TO 2
IF NO - GO TO 3

2. IS SCS WETLAND INVENTORY MAP AVAILABLE?

IF YES, FOR AREAS IDENTIFIED AS FARMED WETLAND, HYDROLOGY
CRITERIA IS MET - FOR ALL OTHER AREAS, GO TO 3
IF NO - GO TO 3

3. IS APPROVED AERIAL IMAGERY AVAILABLE (ASCS SLIDES/AERIAL
PHOTOS, SATELLITE)?

IF YES, HYDROLOGY CRITERIA IS MET WHEN:

- A. IMAGERY HAS WETNESS SIGNATURE IN DRY YEARS; OR
- B. IMAGERY HAS WETNESS SIGNATURE IN MORE THAN HALF THE
NORMAL YEARS INVESTIGATED; OR
- C. SATELLITE IMAGERY INDICATES WETNESS

HYDROLOGY CRITERIA IS NOT MET WHEN:

- A. WETNESS SIGNATURE LACKING IN ALL YEARS; OR
- B. SATELLITE IMAGERY DOES NOT INDICATE WETNESS

HYDROLOGY IS UNKNOWN WHEN:

- A. IMAGERY HAS WETNESS SIGNATURE IN WET YEARS ONLY; OR
- B. IMAGERY HAS WETNESS SIGNATURE IN LESS THAN HALF THE
NORMAL YEARS INVESTIGATED

IF NO - GO TO 4

4. IS APPROVED STREAM GAUGE/FLOOD DATA AVAILABLE?

IF YES, HYDROLOGY CRITERIA IS MET WHEN:

AREAS ARE WITHIN DESIGNATED* FLOOD ELEVATIONS

HYDROLOGY CRITERIA IS NOT MET WHEN:

AREAS ARE OUTSIDE OF DESIGNATED* FLOOD ELEVATIONS

IF NO, HYDROLOGY CRITERIA IS UNKNOWN

* DESIGNATED - APPROVED BASED ON GENERAL REQUIREMENTS THAT
CONSIDER FREQUENCY AND DURATION.